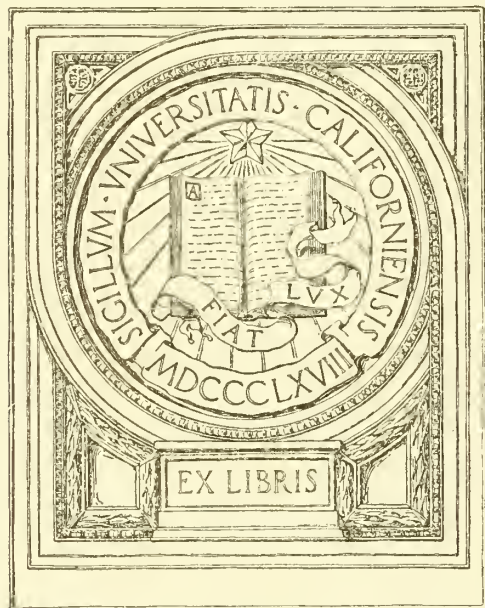



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MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association,
Northern Minnesota Medical Association and Minneapolis Surgical Society*

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VOLUME VIII

JANUARY TO DECEMBER, 1925

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MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association
Northern Minnesota Medical Association and Minneapolis Surgical Society*

VOL. VIII

JANUARY, 1925

No. 1

ORIGINAL ARTICLES

UNUSUAL FEATURES OF CARCINOMA*

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One of the inherent defects of all language is that general terms are often so ill defined that their meaning to various individuals is sufficiently different to render difficult any real community of thought concerning them. This difficulty is more real than apparent. By unconsciously selecting the middle ground, we employ ideographs with solid centers of common knowledge, and thus are fairly successful in an interchange of thought. It is only when our minds begin to wander along the margins or peripheries of these generalizations that we find ourselves involved in a hazy, ill defined maze of contradictions.

No better illustration of this fact can be found than the word "cancer" or "carcinoma". The safe middle ground occupied by the majority of us, signifies the definite notion of an ulcerating, metastasizing, destructive, parasitic growth of epithelial cells and fibrous stroma, a growth which, untreated, inevitably produces the death of its host in the average time of about one year. So long as this concept obtains, there is not the slightest difficulty in the interchange of ideas involving the use of the word "cancer." Everyone, at least every doctor, knows or thinks he knows exactly what is meant by the term, and any conversational difficulty in its use is practically negligible. It is true that the limits of the term are rather wide, inasmuch as cancers vary considerably in rate and manner of growth, appearance, and factors of malignancy, such as infiltration, metastasis and destructive or obstructive replacement. Such variability, however, being well understood, the term still conveys reasonably exact concepts.

The current discussions on the subject, as well as those in the literature, are largely concerned with this central core of our knowledge, and with the majority of its phases we are all fairly familiar. Our only excuse for the constant repetition which is encountered at every point, is the necessity to place deserved emphasis on those features which may awaken us, and, through us, the public, to early recognition, and, with it, early radical treatment. It is a life saving propaganda, and, as such, fully justifies the risk of over-stuffing ourselves and our clients, thus perhaps even defeating the results we desire to accomplish.

Hence it may be all the more desirable occasionally to deviate from the beaten paths of our knowledge, and to wander along the borders where haze obscures the mental pictures, where clear-cut conceptions become impossible, and generalizations no longer can be used. This effort is much easier for the student of pathologic anatomy who sees in the human body many transitions between normal and abnormal, which are so far below the level of clinical phenomena that they often remain only theoretic in interest.

With this object in view, it may be of value to consider a few of the features of carcinoma which do not conform to the usual rule. By no means the least interesting of these is unusual duration. Carcinoma of extremely short duration, with a total clinical course of only a few weeks, is by no means uncommon, but if a cancer lasts for more than two years there naturally arises a question as to whether the growth was actually malignant, although all of us have seen instances of this.

The question of the relative speed that we may expect from any given growth often becomes of clinical importance. If we could be certain that a given tumor was going to proceed very slowly, it would be much more worth while to perform a more thorough palliative operation, or even to attempt a radical cure. I remember my incredulity when the late Dr. J. Clark Stuart told me of an adenocarcinoma of the breast which had existed

*Read before the annual meeting of the Minnesota State Medical Association, St. Cloud, October 9, 1924.

for seventeen years. Since then I have seen a number of very scirrhus carcinomas of the breast of extremely slow growth, one lasting eight, and another ten years.

A similar sort of growth may be found in the gallbladder. I have discovered two of these, of such minor clinical significance as to be missed in the examination, the patient's death coming about from other causes, and of such strict localization that the malignant nature of the process could not be determined with assurance without microscopic study. One of these cases was noted a year and a half after cholecystectomy; it was probable that the cancer was beginning to grow at the time of operation.

Another organ prone to this sort of growth is the pancreas, particularly around the papilla of Vater. If it were not for the early involvement of the common bile duct, these carcinomas undoubtedly would have much longer periods of growth. The point is worth considering in the question of relief of the patients. It is by no means uncommon for a tiny growth to produce a total obstruction of the common bile duct, when operation might have afforded a number of years of relief.

The growths in the three locations mentioned have a common characteristic of a superabundance of connective tissue, small groups of cells or single cells representing the epithelial element and a minimal number of lymphocytes. The epithelial cells may form perfect glands, or may show only occasional globules of mucus. Although carcinomas in other organs may also be of exceedingly slow growth, carcinoma of the larynx deserves special mention. Occasionally hoarseness may be the only symptom in these cases, and may exist for a number of years before any other disability appears. These carcinomas are just as slow, as a rule, to metastasize as they are to grow, and the determination of their true character by the surgeon and the pathologist justifies much more radical efforts, even at a late period, to effect a cure.

I have just mentioned the appearance of mucous droplets in cells as a differential characteristic. This important sign for the differentiation of growths arising from any of the glandular epithelial structures has not received due emphasis. It is quite evident that the mucus-producing epithelial cell is the least differentiated, and that growths from these cells retain with exceeding

tenacity this particular characteristic. We are all familiar with the common so-called colloid carcinoma, *so-called* colloid because it is really a collection of mucus large enough to be appreciable to the naked eye. A large proportion of the growths from the intestinal tract and many other glandular organs are, at least microscopically, of this type, the collections of mucus often reaching considerable amounts. Even when no demonstrable mucus may be found, the individual cells will practically always show in one place or another, large round droplets, quite clear, but in actual test almost indisputably composed of mucus. This point is not only of rather major importance to professional pathologists for the identification of any given growth, but probably is of some importance to the patient. In proportion to the rapidity of the growth, the signs of mucus usually diminish rapidly and, consequently, this element often is a very significant factor in the prognosis. The huge colloid masses that are occasionally seen, particularly in the stomach and in the region of the cecum, are by that same token often of a very low degree of malignancy.

Several years ago, when it became the custom for the surgeon to have at his elbow a pathologist, when the importance of early operations on malignant growths was emphasized, and when the borderlines of diagnosis between inflammatory or involutionary hyperplasias and real carcinomas was a field for debate, there was considerable comment on what were then designated "precancerous" conditions. Many times this term was used without any clear conception of its meaning. Sometimes it referred to a lacerated, eroded cervix, a hypertrophic endometrium, an ulcer of the stomach, a cystic breast, and so forth. The notion had a harmful phase, inasmuch as a considerable amount of destructive surgery was performed in the name of "precancer". But its usefulness probably outweighed the harm, inasmuch as attention was very properly focused on the early appearances of carcinomas at a time when their operability would be most favorable. At the present time, if I have correctly interpreted the matter, there is not nearly so much stressing of "precancers", the pendulum as usual having swung perhaps even too far in the other direction. We are rather insistent that the pathologist tell us whether a growth is malignant or not, and we want definite opinions on this point.

More careful clinical records with follow-up histories have shown us that the fundamental idea underlying the thought of precancerous conditions contains a very useful element. For example, not many years ago and perhaps even now, in some quarters, the surgeon demanded to know whether a given papilloma of the urinary bladder was malignant or benign. If the growth penetrated the bladder wall or showed an undue number of mitotic figures, the pathologist quite promptly pronounced it malignant. But many of the patients with these growths were given a fairly clean bill of health. We are quite certain at this time that every one of these growths in the urinary bladder, in the ureter or in the pelvis of the kidney are really carcinomatous from the beginning. True, they may occasionally be of a very low degree of malignancy, and local excision may prove sufficient for cure. Some of them, indeed, are so insignificant that to apply to them the term "carcinoma" stretches the term almost beyond reason. Hence, the designation "potential carcinoma" has been employed, and at the present state of our knowledge is useful.

To illustrate, in the cortex of the kidney, the pathologist quite frequently runs across tiny whitish or yellowish nodules, varying from almost microscopic dimensions to many centimeters in diameter. From his standpoint these growths have most of the essential characteristics of carcinoma of the kidney. The large majority of them, however, never reach important dimensions and to make the diagnosis of carcinoma of the kidney in the presence of a pin-head nodule is to a clinician almost a *reductio ad absurdum*. Hence, the applicability of the term "potential carcinoma", for that is exactly what these growths are. They may never reach the level of clinical signs, most of them never will, yet every one of them constitutes a potential menace to the individual. How many of these potentialities exist throughout the body, we are unable to state with any degree of certainty, but a few of them are quite clearly established. Adenomas of the cortex of the adrenal, and in the anterior lobe of the pituitary, in most instances entirely innocent, occasionally exhibit strongly destructive properties with only one change in their usual character, and that is their rate of growth. Every one of them is potentially malignant, only waiting for a release of the inhibition which fortu-

nately usually retards its progress. The true position of polypi of the intestine and stomach in this respect is not clear, but there certainly exist types of polypi in the large intestine which are fundamentally true carcinomas, but should probably be classed clinically as potential. Whether the same statement can be made in regard to polypi of the gallbladder and uterus is still a debatable point. The important conclusion seems to be justified that in the adult, after the age of thirty-five at least, there exist myriads, actually myriads, of potentially malignant growths. The wonder is not that a carcinoma develops or that multiple carcinomas are occasionally seen, but that any individual reaches the full three score years and ten without being overwhelmed by carcinoma of almost every variety.

The answer must consist in postulating an inhibitory influence, local, general, or both, on the disorderly growth of epithelial cells. Instances of this phenomenon are a daily occurrence, but it has been insufficiently stressed. The tiny carcinoma of the stomach, giving rise to huge inordinate metastatic growths in the liver or the pleuræ, does not excite sufficient comment. The local inhibition exhibited toward the growth in the stomach, and its almost complete absence in the liver or the pleural cells, is really an astonishing feature. Further study of many of these growths reveals a very marked change in their characters, the older, slower portions showing in their new habitat a rapidity of growth, a lack of differentiation, and a destructive character which occasionally gives the impression of an entirely different form of tumor. Careful study of some of these tumors and their metastatic productions shows that this inhibitory influence occasionally wavers; it is not a consistent property of any given organ, nor of the body as a whole. Under certain conditions the tumor's growth is quite manifestly inhibited, but later on the bars are down and the carcinoma runs wild. These carcinomatous bonds deserve much more careful study. Manifestly they are an inherent property of body cells or juices, varying from time to time, and are the only real intrinsic defensive mechanism against carcinoma. Quite possibly they might be influenced by external means, if we only knew the secret of their application. I do not know of a feature in the study of carcinoma which is more intriguing, or of more importance.

THE DESTRUCTIVE AND CONSTRUCTIVE SURGERY OF MALIGNANCY*

HARRY P. RITCHIE, M.D.
St. Paul

Surgery as exemplified by keen excision and dissection is one of the oldest measures in the treatment of malignancy. The objections to this mode of attack are well known: (1) the possibility of grafting aberrant cells upon newly formed and succulent surfaces; (2) handling and manipulation enhancing glandular metastasis; (3) attempted incomplete removal; (4) creation of a defect with loss of function on the one hand and on the other a cosmetic deformity, either of which may be socially ostracising. The first three are purely surgical problems supposedly under the manual control of the surgeon and particularly his judgment. The fourth is the most important as it is a potent factor in causing the greatest and most frequent handicap in the treatment of this disease: delay in seeking advice. Fear of surgery and its scars is natural and leads not only to delay but to the acceptance of treatment by various agents at a time when the greatest expectation of a cure is surgical removal. The surgeon is also influenced. Because of a very estimable desire to leave a minimum scar he makes a close instead of wide excision.

In malignant tumors, the effort of surgery is destructive which must be balanced by plans for reconstruction. If construction can be made to equal destruction then the early cases will seek surgical removal. So far as my experience now goes, the hope of a cure, not a three-year or five-year but a cure without qualification, is a local growth widely removed.

Consideration of reparative steps is no new thought. Wherever function of a part or life itself is involved the procedures have been widely developed. The Polya operation, independently conceived in its principles by Dr. W. J. Mayo, developed in its details by him, has revolutionized the surgery of carcinoma of the stomach, justifying the attempt of wide removal even in gross involvement. While there are several plans for anastomosis, they carry extra steps often enough to unbalance the patient. Thought and consideration to the reparative problems developed this technic

which has changed the whole aspect of the condition in this organ.

The Mikulicz operation for carcinoma of the sigmoid is almost always successful. It is not only an attempt at a cure but carries true constructive steps. Balfour's tube anastomosis, the various plans for reuniting the small bowel to the large in right sided malignancy are all illustrative. Coffey's procedures for carcinoma of the rectum are being widely considered because no satisfactory plans appear possible for establishing the continuity of the bowel in this location, but are only acceptable because inguinal colostomy as now done and cared for is not incompatible with health and comfort.

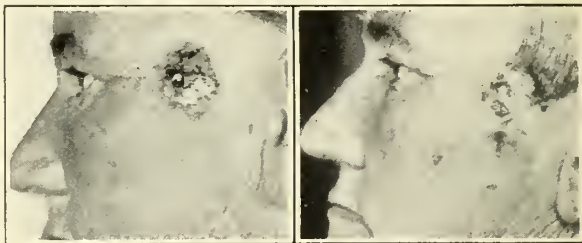


Fig. 1. A squamous celled carcinoma, removed by keen excision and immediately repaired by use of the thin Ollier-Thiersch graft. A great part of the result with this graft is due to contraction. A scar forms, so this method is not to be used in exposed places of the face.

In internal carcinoma surgery appears the proper procedure because in no other way can the situation be determined, and given only a fair chance its cures are many. The solution of the reparative problem is imperative, has received the most attention and is the most perfected.

External and accessible malignancy is now the most interesting field for study. Exposed, the new growth is open to extraneous influence; accessible, it is the most inviting field for the application of the various destructive agents of known and valued action or the use of inert preparations by the ignorant and unscrupulous. The discussion of the relative merits of destructive agents and study of their action must eventually yield results, but while we are waiting for the universal cure, it appears to me most reasonable to consider each case on the following well known questions and particularly in this order:

1. What is the pathology?
2. Is the growth local?
3. Can it be removed?
4. Can an acceptable repair be made?

*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, October 9, 1924.

WHAT IS THE PATHOLOGY?

The pathology is essential. Most of the new growths are epithelial in origin. We know that there are several histological forms but they are frequently all grouped under the blanket term cancer. The laity surely so considers them and even among the profession it occasionally comes to our notice that there is laxity in this respect. We must have the original picture to make sure that we are dealing with a histologically malignant tumor and to make a keen distinction between the occasional sarcoma, the low grade odd tumors, the basal celled and squamous celled epithelial growth. The basal celled from clinical observation is local over many years of non-treatment, incomplete treatment and recurrence and gives us every chance for a cure, whereas the squamous and adeno may be early out of bounds. While in many instances a clinical differentiation is correct, it is surprising when cases are routinely checked how often a mistake is made. Biopsy is often necessary. The propriety of this procedure is debatable. My belief is that it is proper if followed by immediate treatment. Biopsy and delayed treatment invites inflammatory reaction, possible dissemination of the disease and is therefore to be deprecated.

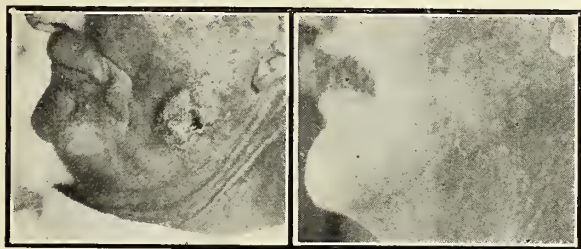


Fig. 2. A squamous celled carcinoma removed under local anesthesia by keen excision and the wound immediately repaired by the use of the full thickness graft of the Krause-Woulfe form. The resurrection of this graft is the greatest forward step in plastic surgery. The graft is thick and revascularizes and leaves a hardly appreciable scar. For use on the exposed places.

The histology is necessary but a clinical grouping is the greatest need. Broders has offered a four grade plan based upon cellular activity, a most important step in advance. If it were possible to join this with location, extent and glandular involvement of the growth it would be the greatest help. But we can agree that no longer can we study or discuss treatment or results from the general viewpoint of cancer.

IS THE GROWTH LOCAL?

The basal celled epithelioma is clinically local and usually runs true to form but there are occasional instances which indicate that there may be varieties of this growth. I have also seen squamous develop upon the apparently cured basal celled. With this type as well as the squamous, the question of superimposed inflammation must be considered. When we get into this field many clinical pictures result. Ulcerative changes may as well be due to infection as growth extension. It is no uncommon history to obtain of a sudden and recent change in a hitherto resistant tumor and when they appear for treatment the condition seems hopeless.

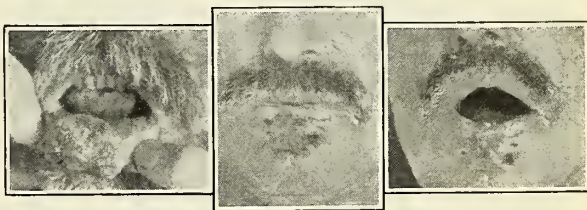


Fig. 3. The typical epithelioma of the lip, removed after gland dissection by keen excision and mobilization of flaps, not only of skin but of mucous membrane from the cheek, everted to construct the lower lip. In this case less than one-half inch of the former lip is present now, showing the possibilities of wide removal of the growth and yet making a satisfactory reconstruction.

It must also be remembered that the same tumor may appear differently in the several locations. The study of the original growth from the history occurrence, extension and present involvement is of course necessary. But it does not compare in importance to the study of the glandular system. Whenever glands are involved or become involved there is no assurance of a cure from any form of treatment and our efforts are so often palliative. A cancer death usually occurs some time. In one case it followed as long as seven years after inguinal adenitis following carcinoma of the genitals. No mammary carcinoma with supraclavicular involvement has lived over a year. No case of neck involvement where more than one gland was affected but what has eventually died from the disease. So far, I have been an advocate of gland dissection before any form of treatment is undertaken in the squamous type. In carcinoma of the cervix the anatomical area involved renders the procedure too formidable with no certainty of accomplishment. In the records of Dr. MacLaren and myself the only cases of carcinoma of the cervix cured were treated by vaginal hysterectomy, which means that the growth was local. In the inguinal, axil-

lary and cervical areas the only way to find out is by dissection. When we study the glandular system we are lost in a maze of anatomy and any attempt to remove all glands draining an infected area appears futile. But in the neck there are glands which may be considered sentinels. There are five: the top of the carotid chain on either side, the two sub-maxillaries, and the first or more often the second of the sub-mental. If these are free then there is a fair presumption that the original

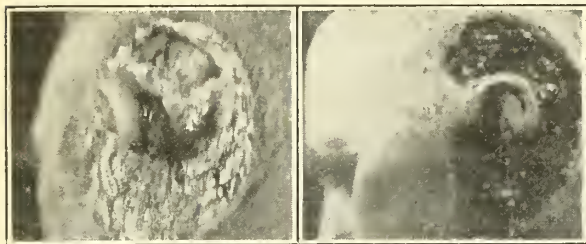


Fig. 4. A basal celled carcinoma representing cautery excision with delayed but early repair. After excision, the wound is Dakinized and so soon as clean granulations appear the area is covered by the use of the small deep graft of Davis. This graft is not a pinch graft but a good deep button of skin. This graft seems to take under all circumstances.

growth is local and justifies extreme measures. But if involved then there is no assurance of a cure from any form of treatment and surgical attack is often debatable. If all mammary carcinoma with palpable axillary glands were excluded, then surgery would be little used. But we are now beginning to see cases so early as to find single glands instead of the old fixed bunch and an occasional case in which no glands are found at all. In the neck and axilla, the justification of dissection of palpable glands is that frequently these are found inflammatory. The study of the glands in squamous carcinoma is equally if not more important than the study of the original growth.

CAN IT BE REMOVED?

All growths upon the face, head and neck, the breast, genitals, scars upon the body can be removed. The surgical treatment is only limited by the invasion of underlying tissues involving essential structures. Within the mouth there are several handicaps: (1) the difficulty of approach; (2) location in relation to bone; (3) the coarseness of our instruments. Marginal carcinoma of the tongue can readily be removed either by the cut and sew technic or by the cautery knife without blood loss. The mucous membrane of the cheek and lips can also be widely excised. Carcinoma of the

floor of the mouth, carcinoma involving the alveolar process either upper or lower, posterior to the heel of the process, the tonsil area, and those involving the antrum, are most uncertain and in these areas attempt at excision is often abortive and destruction in situ is only possible. The use of the cautery knife near a bone causes a penalty of a sequestrum separating in from four to six months. The use of the cautery makes a coarse procedure and many times would shame a blacksmith. It does overcome many of the objections to keen excision, carries with its use hemostasis but our irons and electric cautery are so clumsy that they detract from certain work. The instrument of dehydration elaborated by Wyeth has a great appeal, as it meets many requirements and by its structure permits of more artistic and exact surgery.

CAN AN ACCEPTABLE REPAIR BE MADE?

In the field of external malignancy, there is the greatest opportunity for the selection of the various reparative measures and these are just as important from a cosmetic viewpoint as are the restoration of function in internal carcinoma.

The principles of tissue transference are known to every one but important observations have been made in the past few years, details which have augmented the use of skin grafts and flaps to a point where failure comes as a surprise.

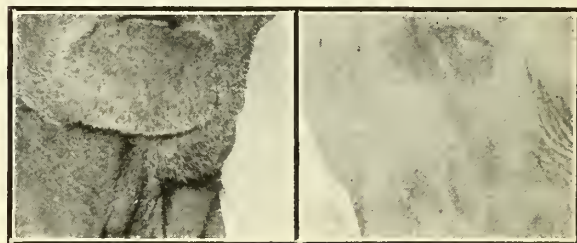


Fig. 5. A gross squamous celled carcinoma, which was removed by cautery excision. The defect was repaired by the use of a pedicle flap from the neck which can be seen in place over three years after the removal of a large tumor.

The resurrection of the full thickness skin graft; the possibilities of the small deep graft; the popular large thin graft; the selection of transference of tissue in group using the flap; the jump, the tubular, the delayed flap; the proof that skin will assume function of mucous membrane; the delayed flap on the palate; the wonderful development of prosthetic features, where noses and ears may be made in moulds with startling results; the splendid efforts in reconstructive dentistry; all indicate that

we must inject into the surgery of external malignancy, not only the effort at a cure but the principles and procedures of constructive surgery.

In the individual case the question of repair is divided between two possible plans: (1) keen excision and immediate repair; (2) cautery excision or destruction and delayed repair, which in turn is subdivided into early and remote. To elaborate

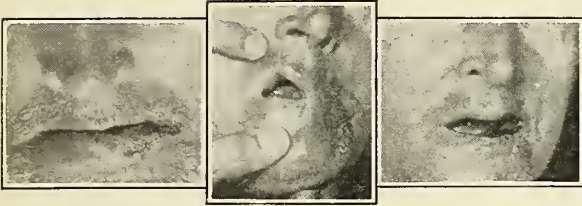


Fig. 6. An example of cautery excision and remotely delayed repair. A large squamous carcinoma on the inside of the left cheek with leucoplakia surrounding it and extending on to the lips. Wherever carcinoma appeared the skin was removed also by means of the cautery knife. Flaps remaining were used to close the wound and the patient was given one-half of a mouth, which he carried for one year. At that time no signs of a return were present, so his mouth was reconstructed.

plans in solving these questions is not now possible because each case must be considered alone. But I can see cases grouping themselves, along pathological lines and selective reconstructive steps. We as clinicians are more interested in the cure and its methods while so often the patient is more concerned with possible scar or loss of function.

Through the work and teachings of Davis, Blair, New, Keller, Ivy and many others all these details are in the literature for the use of anyone. And it is our duty to the patient to not only discuss methods of destruction but methods of construction. I believe that all our educational plans shall be directed towards the patient with a local growth, that all our efforts in diagnosis be directed to proving or disproving a local growth, and, proving the growth local, the possibility of surgical removal and reconstruction is the primary object.

The very wonderful effect of the agents of irradiation is in many cases startling, but the fond hope of their universal cure is not as yet proven. The discussion of a cure is not upon their relative merits, is not to be undertaken in a competitive spirit because we are grateful for them, not only radium and x-ray but chemicals and electricity. They all have their use and our earnest effort is to locate them in sequence and combination with surgery. But if we are seeking an unqualified cure then I believe the answer is a local growth widely removed.

THE RELATIVE VALUES OF SURGERY AND RADIOTHERAPY*

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In the preparation of this paper I have been fortunate in having an opportunity to discuss its various phases with my colleagues, Dr. Desjardins and Dr. Bowing. If I may be permitted to insert a conclusion into the opening paragraph, I will say that surgery and radiotherapy are both highly developed specialties which must be used with close co-operation if the best results for the patient suffering from cancer are to be attained, and, after all, this is the important consideration.

For the proper evaluation of the present position of radiotherapy in the treatment of malignant disease, one must take into consideration the results of the modern operation for cancer. Statistics must be sufficiently recent to insure the application of the newer operative methods, and yet sufficient time, from three to five years, must have elapsed since operation to permit the estimation of the percentage of cures.

Cancer consists wholly of the parasitic cancer cell. The stroma represents nature's defense. Nature treats this malignant cell like a foreign body, throwing out a stroma around it, which contracts and cuts off the blood supply. This no doubt often results in complete obliteration of the cell. Postmortem examination of persons who have died from metastatic disease in the lungs, for instance, will not only reveal large areas of cancer, but also extremely small areas. Scattered through the lung tissue are sometimes to be found little nodes of connective tissue which do not enclose living cancer cells, and yet one must conclude that they originally contained cancer cells which later became obliterated. Irradiation not only destroys the colloids of the embryonic cell, but also develops such masses of connective tissue as will, no doubt, eventually destroy some or possibly all of the cells, that were not killed by the rays. Truth is stranger than fiction.

In operating on patients who have been irradiated, one is impressed by the enormous amount of contracting scar tissue which can scarcely be cut, and yet, usually at some point in this tissue, per-

*Read before the annual meeting of the Minnesota State Medical Association, St. Cloud, October 9, 1924.

haps along the unobliterated blood vessels, there will be malignant cells that have been able to maintain their nutrition, owing to the fact that the flowing of the blood in the vessels acts both as a nutrient mechanism, and as a means of interfering with the action of the rays. The struggle, on the one hand, of the defensive scar tissue to encapsulate and obliterate, and, on the other hand, of the offensive cancer cell to survive by intense biologic activity, continues for a considerable time. The result in a given case is problematic.

Relatively, radiotherapy makes a better showing than surgery for a short period, because the knife has no such tendency to cause the development of scar tissue. If the growth recurs, it will probably recur much sooner following operation, other things being equal, than following irradiation.

Modern operative procedures not only remove diseased tissue, but also the paths by which malignant cells reach locations beyond the primary focus. Operation removes, in a block, the lymph nodes adjacent to the growth. Admitting that radiotherapy often affects secondary cancer of the lymph nodes favorably, by destroying the immature cells that cause the growth, and by initiating the development of connective tissue which contracts and cuts off the circulation, it is by no means as reliable as surgery, and, at least so far as I have been able to determine, the method of application employed in the past seldom cures.

Only particles of molecular size, such as sugar, the amino-acids, and other crystalloids, are absorbed directly through the vascular capillaries of the body. Colloids and large particles are picked up by the lymphatics. Bacteria and malignant cells, therefore, do not pass directly into the capillaries, but are carried by phagocytes into the lymphatics, which are a closed system of vessels. This process of phagocytosis is carried on by the widespread cells of the reticulo-endothelial system.

When the lymphatics are not involved, the percentage of surgical cures, as shown by a study of our cases, is more than 72 per cent for five years, but when they are involved, there are only 19+ per cent of cures. These percentages, however, are averages; the percentage of cures in cases in which only a few lymphatics are involved is very high, as contrasted with that in cases in which all the tributary lymphatic glands are involved.

This question of the involvement of the lymphatics has another angle. In certain organs, such

as the large intestine, the lymphatic glands are usually enlarged, even in the early stages of cancer, and yet this enlargement may not be malignant. Many times in operating on cancer of the large intestine for which a colostomy had been made elsewhere, radical operation having been refused because of enlarged glands, microscopic examination of the glands has revealed the fact that the enlargement was due to sepsis.

Wilson, twenty years ago, introduced the method of the instantaneous staining of frozen sections by polychrome methyl blue, a method which has been one of the most important contributions to the microscopic study of living pathology.

MacCarty points out that the greater the amount of nuclear material in proportion to the cytoplasm of the cell, the greater its growing power, and that if the cytoplasm does not differentiate properly, growth without function results; in other words, malignancy is established by the tremendous oxidizing power of the nuclei which deprives the normal cells of their nourishment.

Broders has demonstrated that the greater the differentiation of the cell, the lower is the degree of malignancy. Based on this fact, in a study of 1,628 cases of squamous-cell cancer, he established an index of malignancy. The cases studied were divided, according to the degree of cellular differentiation, into four groups of different grades: Cancers in which about 75 per cent of the cells were differentiated and 25 per cent were embryonic, or undifferentiated (Grade 1); cancers in which the percentage of nearly normal cells and embryonic cells was about equal (Grade 2); cancers in which about 25 per cent of the cells showed evidence of differentiation, and about 75 per cent no differentiation (Grade 3); and cancers in which the microscopic sections showed no evidence of differentiation (Grade 4). The ultimate results in each case following operation were then investigated, and it was found that in the first group good results were obtained in 92 per cent; in the second group, in 62 per cent; in the third group, in 25 per cent, and in the fourth group, in only 10 per cent. Broders confirmed these findings by applying this index of malignancy to a larger series of cases.

Evans, in 1919, studied the pathologic conditions in 4,000 cases of uterine myoma in the Clinic, to determine the percentage of those undergoing sarcomatous change, and demonstrated that the per-

centage of mitotic figures in cells of the malignant connective tissue group gave a reliable index of the malignancy.

Bowing has shown, by sections from cancerous areas removed before and after irradiation, that a change often occurs in the cell structure after irradiation, the embryonic undifferentiated cells showing a tendency to differentiate and mature. These observations of MacCarty, Broders, Evans and Bowing confirm pathologically a fact that has long been known clinically: that cancer varies greatly in malignancy, and that its curability depends on the malignancy as well as on the situation and the stage of development of the growth.

A surgical operation, properly conducted, in well selected cases has a tremendous advantage over radiotherapy, chiefly in the exactness with which the diagnosis can be made and the limitations of the growth approximately defined. The surgeon no longer works by the unaided senses, but by sight aided by the microscope. The condition in doubtful fields is quickly and accurately determined within three minutes, by the examination of frozen sections. Not only can the malignancy of the growth be established, but also the grade of the malignancy. In the presence of a large percentage of differentiated cells, surgical operation is not only justifiable, but imperative. It is obvious, therefore, that the results of operation depend not only on the possibility of removing the local evidence of the disease, the lymphatic pathways, and the regional lymph nodes along which progress away from the locality could be expected, but also on cellular activity. When the cells are highly undifferentiated, operation, because of the immediate danger and small prospect of cure, may not be as rational as radiotherapy. It is in the cases of highly undifferentiated cellular growths, Grades 3 and 4 in Broders' index of malignancy, in which surgery offers but a small prospect of cure, that radiotherapy has its remarkable value.

I have witnessed the rapid disappearance, under radiotherapy, of enormous cellular tumors in the abdomen for instance, secondary to malignant teratomas of the testes. Experience has taught that the surgical removal of these secondary growths is fraught with danger, and is generally futile, but several of our patients with such growths have apparently been cured by radiotherapy for three years, and in one case for more than five years.

It will be seen, therefore, that surgery and radiotherapy, in a way, are complements of each other. Surgery, however, has a wider application since it can be applied with accuracy to the large group of cases of cancer of the gastro-intestinal tract, and other internal regions in which radiotherapy is at best seldom curative. The attempt to treat deep-seated internal cancer by irradiation is difficult and uncertain; it is justified only when incurability of the lesion by the knife has been demonstrated.

Radium has had its greatest triumph in the treatment of cancer of the cervix uteri. In the favorable case, radium is not only a compeer of the knife, but in the advanced case, when the vaginal fornix or the broad ligament is involved, it is the treatment of choice. The rays affect the embryonic cell with special vigor, while the sound tissues, such as the ureters, are little affected. On the contrary, in cancer of the body of the uterus, taking good, bad, and indifferent cases, surgery cures from 70 to 80 per cent, and radium and x-rays produce poor results. It has been a common experience in the Clinic, that even after radium had been used by experienced men in the body of the cancerous uterus for prolonged periods, it was eventually necessary to remove the uterus, because some part of it still contained malignant disease. Bowing has shown that certain patients, however, in whom, by reason of age, extensive cardiovascular lesions, obesity, and so forth, the risk of a total abdominal hysterectomy is great, may be benefited and possibly cured by irradiation following curettement. In early external cancers, while the growth is still strictly localized, radium will give results comparable to those obtained with the knife. From the cosmetic standpoint, there is much to commend the use of radium in certain situations, especially about the eyelids, where scar-tissue contractures are so troublesome.

Clark, in a recent article, voices my own experience that radiotherapy is effective almost immediately, if at all. The proper application of radium to cancer of the cervix, for instance, probably will accomplish all that can be accomplished. For fear that it may not have been accurately applied, further treatment may be given in certain cases, but rarely a third. When one sees the great number of persons with cancer undergoing repeated treatments with radium and x-ray, paying in advance for the very slight prospect of benefit other than psychic, one feels like uttering a protest. The pa-

tient should have the benefit of any doubt, but when radiotherapy is used as the quacks use it, valuable therapeutic aids are brought into disrepute.

The most difficult aspect of my subject concerns the combined use of surgery and radiotherapy. Combination of surgical and radiotherapeutic methods, unless to meet definite indication, has been disappointing. In twelve cases of cancer of the stomach, after finding the condition inoperable, I made a gastrostomy and introduced a tube into the malignant end of the stomach in order to bring radium to bear effectively on the disease. None of the patients was alive at the end of a year. In other instances, I have made colostomies just above a malignant growth of the colon in order to bring radium down into the lumen, the radium being guided into exact position with the finger. Several of the patients were greatly benefited, but none cured. I do not say this to disparage radiotherapy, because these cases were advanced and beyond the possibility of being benefited by surgery; perhaps the treatment was inadequately applied, since possibly all portions of the tumor were not reached; but had the results been better, one's faith in the general application of irradiation would have been greatly strengthened.

It is interesting to trace the cases in which we have removed the greater part of the lesion surgically and then, because malignant tissue definitely or possibly remained, applied radiotherapy. Generally speaking, the results have been disappointing. In the cases in which I knew help was needed, cure was not effected, and in the cases in which I hoped that I had removed all the diseased tissue, there was no way to tell whether the attempt to insure cure by radiotherapy had been of value.

Among certain surgeons of great ability there has been a belief that in many, if not all, surgical cases of this description, irradiation before and after operation is beneficial. When one sees large cancers in the chest wall, which have metastasized from the breast, respond marvelously to x-rays or radium, the advisability suggests itself of giving every patient the possible advantage of such treatment, although cure is not to be expected. Desjardins calls attention to the danger of surgical invasion into certain cancerous fields, which have been greatly benefited but not cured by x-ray therapy, because of the risk of initiating a rapid extension of the disease. In this connection, Bowing also points

out the necessity for caution in deciding to operate on growths primarily inoperable, which have been greatly benefited by radium, because of the danger of opening up new channels of infection.

Unfortunately, the question of the curability of cancer is too often academic, because of the very large number of incurable cases that reach the surgeon, in which palliation is the utmost he can achieve. Here radiotherapy is, at its best, a triumph and a despair. It often does so much good that the patient and family begin to look for and expect cure, but death, not cure, comes eventually, and radiotherapy is unjustly brought into disrepute after a meritorious performance.

An unpleasant part of this discussion concerns the persons who are to use radium and x-ray for the cure of cancer. When this work is done by men of wide experience, associated with an experienced surgeon and a competent pathologist, radiotherapy has great value. Today a large number of men with a small amount of radium, or with an x-ray machine, are treating operable cancers. As I heard a surgeon say, "With a nickel's worth of radium, a million dollars' worth of harm can be done." The use of radium and x-ray for therapeutic purposes is as much a specialty as surgery, but in the hands of the inexperienced, or of those who depend on the clinical diagnosis of the disease, it becomes a menace.

Electrothermic methods are proving to be valuable therapeutic adjuncts, especially in the cases of superficial tumors in which the anatomic relations will not permit wide surgical removal, or in which intensive radiotherapy is contraindicated.

Surgery, x-ray, radium, and electrothermic methods will cure cancer, but the choice of method for a particular case should only be determined after serious consultation.

GLYEUHYMENOL NOT ACCEPTED FOR N. N. R.

According to Nixon, Stuart and Barker, Glyeuthymenol is "a scientifically formulated combination of Eucalyptol, Thymol, Menthol, Sodium Benzoate and Zinc Sulphate with a Glycerin base." Glyeuthymenol is to be applied to the cervix by means of a special applicator and, according to the label, it is "indicated in leucorrhea and as a vaginal antiseptic and prophylactic." The advertising designates Glyeuthymenol as a "vaginal prophylactic" and stresses its use as a preventive of gonorrhea and as a contraceptive. The Council holds Glyeuthymenol an unscientific mixture that is sold with claims that are misleading and unwarranted and the use of which is inimical to the public health. (*Journal A. M. A.*, Nov. 15, 1924, p. 1606.)

WHAT THE LAITY SHOULD KNOW ABOUT CANCER*

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The American Society for the Control of Cancer is an organization which was founded in May, 1913. Under the auspices of this body, lectures have been given all over the United States. The society offers suggestions for material to be presented in such talks and has issued numerous pamphlets for lay and professional readers. For several years Dr. E. T. Bell, Professor of Pathology at the University Medical School, and I have talked to various audiences on the subject of the cause and prevention of cancer.

A conservative program was outlined and an attempt made to present the material in such a way that the listeners carried away a definite idea of cancer. Lantern slides showing illustrations and striking facts have been very helpful. There are two phases which may be stressed: (1) various ideas regarding the cause, and (2) the means of early recognition. We consider the latter more important. Cancer causes one death out of every ten after the age of 40 years. About 90,000 persons die of cancer in the United States every year. The purpose of the national campaign has been to lower this death rate. The method of attack has been patterned after that used in the anti-tuberculosis work. The problems present some features in common, the chief one being that in early recognition lies the hope of cure.

In order to accomplish results comparable to those obtained in the anti-tuberculosis campaign the laity should be as well informed upon the early signs of cancer as they are upon those of tuberculosis. Very few people wait before consulting a physician when they have a chronic cough, loss of weight, or are spitting blood. Education has accomplished this.

Ninety per cent of cancer occurs after the age of thirty-five years. The establishment in people's minds of a definite time of life when cancer may occur is of value. It must not be lost sight of that cancer between the ages of twenty-five and thirty-five years is not unusual.

There is a deplorable tendency of some lecturers to overestimate the probability of cure of cancer. Such statements as "90 per cent of the cancer deaths which occur in any given community are preventable" are not based upon facts. A more conservative estimate of the situation places this figure at one-third, or approximately 30,000 lives which may be saved by early recognition and adequate treatment. Statistics indicate that 35,000 persons die of cancer of the stomach and liver every year and 26,500 of cancer of the peritoneum, intestines and other portions of the body, groups in which early recognition is very difficult, and in which cures even of early cases are rare.

The cause of cancer is always of interest to lay audiences. Contradictory impressions are gained from the daily press as to the exact status of this question. The following statements are probably true at the present time.

1. Cancer is not a germ disease. While it bears some points of similarity to chronic infection, no definite organism has been found to cause cancer.
2. It is not contagious. A great deal of misapprehension exists on this point. The care of infected tumors is the same as that for other infections.
3. It is not a constitutional disease. Much of the material which appears in various types of magazines relating to the cause of cancer deals with such vague subjects as dietary factors, failure to keep in good physical condition, etc.

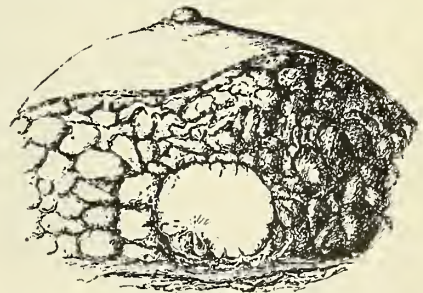


Fig. 1. A lump is the chief early sign of cancer of the breast.

4. Human cancer has not been proved hereditary. There is conclusive evidence to show that the tendency of white mice to develop spontaneous tumors is governed by the laws of heredity.¹ Similar data are wanting for man, although exceptional families where this is probably true have been

*Read before the annual meeting of the Minnesota State Medical Association, St. Cloud, October 9, 1924.

studied. Even those who strongly incline toward the hereditary factor do not consider this the fundamental cause of cancer but rather a predisposing influence.

5. Beginning cancer is a local disease.

6. Chronic irritation is a cause of certain varieties of cancer. Familiar examples are tumors developing in the mouth from irritation of ragged, carious teeth and badly fitting dental appliances. The production of keratoses from exposure to sunlight which later may become malignant² and the development of cancer in x-ray workers of an early day are also examples.³

It is hardly fair to say that we know nothing of the cause of cancer when experimental workers can produce it at will in mice by the application of tar.⁴ The development of tar cancer following tar itch in workers in dye factories is not debatable.⁵ The development of cancer of the scrotum in chimney sweeps has established soot as a chronic irritant. The tobacco quid held at one place in the mouth over a long period of time is another familiar example.

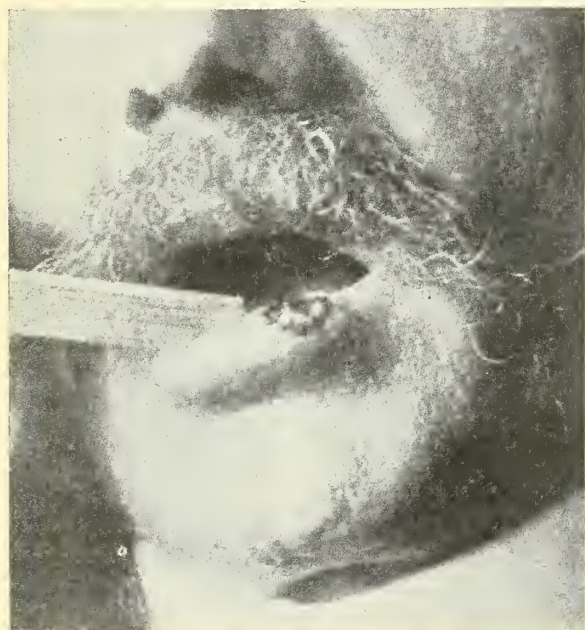


Fig. 2. The sore that does not heal may be cancer. Squamous cell carcinoma of the lower lip, early stage. Illustration from Ewing, *Neoplastic Diseases*, 1922.

Instruction of lay persons as to the early signs of cancer should be simple. We have reduced this instruction to a few formulæ. Cancer always begins as a single small lump or sore. Examples of

the lump are common but the breast is the most important (Fig. 1). Most of the lumps for which women consult physicians are not cancer. Many patients do not come until the lump has been present for some time, although they have just discovered it. Periodic physical examination or the examination of the breasts on the first day of the menstrual period (by the patient) are suggestions

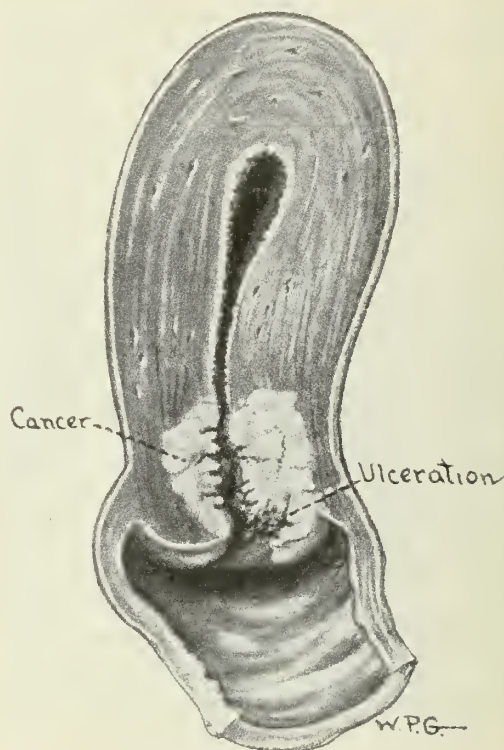


Fig. 3. Sores upon the inside of the body that will not heal may be cancer. They give evidence of their presence by bleeding. Squamous cell carcinoma of the cervix. Illustration from Crossen, *Diseases of Women*, 1922.

of value. A lump in any other part of the body may be cancer. A sore that does not heal may be cancer (Fig. 2). The usual locations are the lower lip, face and hands. About 90 per cent of cancer of the skin occurs above the collar. The limit of thirty days may be placed upon the failure of a sore to heal before coming in for special attention. We tell lay audiences that the only sure means of finding out whether a lump or sore is cancerous is by removal and examination.

Just as sores upon the outside of the body that will not heal may be cancer, so sores upon the

inside of the body that will not heal may be cancer. The latter give evidence of their presence by bleeding, so that unusual bleeding from the uterus in women (Fig. 3) or from the bowel or bladder in either sex should arouse suspicion.

Cancer is rare in a clean mouth. The treatment of precancerous lesions of the mouth is the most important preventive measure that can be used.

Most audiences are confused by the advice usually given regarding moles. Most people have moles but the number of moles that become malignant is very small. Removal of all moles as precancerous lesions is a doubtful measure. Only moles subjected to chronic irritation should be removed. The use of the electric needle should be condemned and only wide excision or destruction by radium advised.

The early signs of cancer of the stomach are not well known. Many patients with this disease do not know of its presence until too late. Persistent indigestion developing in middle life in persons who have never had gastric distress may be due to cancer. There are several other causes of the same complaint, so that the advice given cannot be very specific.

We do not recommend any special form of treatment. We attempt to convey the idea that the only efficient means of eradicating a local growth is by removal or destruction. The use of pastes is condemned. There is no known medicine which will cure cancer. Illustrative slides from the Department of Agriculture, showing analyses of various cancer fake remedies, have been used.

We believe that the most important phase of cancer education for lay persons is to teach them the early signs of cancer so that they may come to the physician when the disease is still in a curable stage.

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A REPORT OF ONE HUNDRED CASES OF AMEBIASIS OBSERVED AT U. S. VETERANS' HOSPITAL NO. 65*

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St. Paul

In presenting this subject for your consideration, I have nothing new or startling to offer, either in the matter of diagnosis or treatment, but wish to invite your attention to what appears to me to be a rather common disease in this district at this time, especially among ex-service men, and to raise the question as to whether the existing prevalence is a post-bellum invasion or whether it prevailed with equal frequency prior to the World War.

That the disease is comparatively common among young men, born and raised in this district, who took part in the recent war, especially among those who were overseas, is demonstrated by the fact that out of less than one thousand cases admitted to the general medical ward in Aberdeen Hospital over a period of twenty months, one hundred were found to have amebiasis. In each of these cases the *Entameba histolytica* was demonstrated in the stools on repeated examinations.

When it became apparent that we were finding so many cases in which the disease had been overlooked in other service hospitals, in private hospitals and by private physicians, I began to wonder if we were not "seeing things" and, therefore, proceeded to check our laboratory findings in every way possible. This check has been so complete and persisted in so long that I think I am safe in assuming that our laboratory technician is not making a mistake, but is finding the ameba, and her findings are supported by the results secured in treating these cases for amebiasis.

Repeated examinations of feces from the same patient have in several instances, revealed both the *Entameba coli* and the *Entameba histolytica*. The finding of motile ameba indicates that a parasite is being observed rather than a phagocytic cell. Motile ameba containing red blood cells have been classified as *Entameba histolytica*, and those containing bacteria as *Entameba coli*. Another distinguishing feature is the appearance of the pseudopode, *Entameba histolytica*, putting forth clear ecto-

*Presented before the Annual Meeting of the Minnesota State Medical Association, St. Cloud, October, 1924, with the approval of U. S. Veterans' Bureau.

plasm, while the *Entameba coli* projects ecto- and endoplasm. The recognition of the cystic stage is a more difficult matter. We are using the iron-hematoxyline stain in differentiation of the encysted forms. In the study of these cases we have had the opportunity of observing repeatedly both the encysted and motile stages in the same individual. This series of cases embodies only those in which motile ameba bearing red blood cells were found.

I have only hinted at the laboratory technique, as there is an abundance of literature on the subject written by more competent hands.

In a number of our cases both the *Entameba histolytica* and the *Entameba coli* were found. In a surprisingly large number of cases the *chilomastix* are found in conjunction with the ameba and these persist long after the amebæ have disappeared from the stools. So far as I have seen in the literature the *chilomastix* is not considered a serious infection, but from my observation of these cases I am convinced that this parasite is not a welcome visitor in the human intestinal canal. So far, all that I can say is that it is found alone most frequently in those cases that show alternating attacks of constipation and diarrhea.

In the face of finding more than 10 per cent of the cases admitted to one ward to be suffering from amebiasis, I invite your attention to the various diagnoses under which these cases were sent to the hospital, especially to the fact that only nine of them were even suspected of having amebiasis, and of these nine three were diagnosed at the Mayo Clinic and four sent here from Kentucky. I also invite your attention to the fact that, almost without exception, these cases had all been treated in other service hospitals, in private hospitals and by family physicians, but in only nine of the one hundred was amebiasis even suspected. It is evident then that the disease is frequently being overlooked in the ex-service men and the question is "Is it not being overlooked with equal frequency in other classes?" and "If overlooked now was it overlooked with equal frequency five or ten years ago?" (During the last four or five months, and since the data for this paper were collected, a number of cases have been sent to the hospital under a diagnosis of amebiasis.)

That the finding of amebiasis in this district at this time, whereas it was not found five or ten years ago, is not something peculiar to this locality, is demonstrated by a report of thirty-one cases in

Seattle, Washington, by Dr. George E. Dowling.* So far as I know, this is the first report of amebiasis in Washington State. Did it exist before and is it just now being recognized or is it something new? It is interesting to note that Dr. Dowling raises the question of the influence of an increased Oriental population in Washington on the prevalence of this disease. At the same time we note that, in discussing Dr. Dowling's paper, Dr. Harold W. Wright, of San Francisco, says: "During the past year I have analyzed twenty-five cases of this infection. Every one of these cases were referred to me because they were nervous, and were considered to be neurasthenics. There were some neurotic disturbances. The average duration of symptoms before the final diagnosis was three and a half years. Some of these men seemed to have contracted the infection in Camp Lewis, and the rest in France and in the Philippines."

Surely the oriental problem is as great in California as it is in Washington, and yet Dr. Wright places the responsibility of infection squarely on their military service without question of the local oriental population. I am inclined to agree with Dr. Wright in regard to the ex-service man, but at the same time I believe there is strong presumptive evidence that the disease has existed in a mild form in this and other localities for a long time and that it is just now beginning to be recognized. In regard to the ex-service men, the class of cases that come under my observation, it is not reasonable to assume that they would have gone to the age of twenty or thirty years without presenting any symptoms had they been infected with amebiasis before entering military service. But these men have been back from the front five years. If amebiasis is communicable (and I think that is granted) then how much longer must you wait before you expect to find infection among their sisters, brothers, cousins and aunts?

In Hygienic Laboratory Bulletin Number 133 of the U. S. Public Health Service is set forth the result of an attempt by correspondence to determine whether there has been an increase in amebiasis following the war. Out of 440 hospitals heard from only fifteen reported an increase in amebiasis. Out of fifty-nine medical schools heard from only ten reported an increase. This result serves only to confirm my contention, namely: the disease is not being recognized. I am firmly of the

*Jour. Am. Med. Assn., November 17, 1923, p. 1657.

opinion that if a systematic examination of stools is made in all cases the *Entameba histolytica* will be found in a surprisingly large percentage of the cases.

Kofoed and Swezy (New Orleans Medical and Surgical Journal, July, 1920) report the finding of the *Entameba dysenterice* (*histolytica*) in sixty-one, or sixty-seven per cent, of ninety-one students examined at the University of California. These were all discharged soldiers that had been overseas. Out of thirty-four discharged soldiers who had not been overseas only nine, or twenty-six and one-half per cent, were found to be infected.

With such findings by men of unquestioned ability among men who are apparently sound, at least not presenting any subjective symptoms, is it not reasonable to expect that we will, with care, find a like number of infections among men who are presenting a series of symptoms that cannot otherwise be accounted for? In the face of Kofoed's findings it would seem that I am overlooking about four out of five, rather than finding too many.

DIAGNOSIS

The ultimate diagnosis in these cases depends on the accuracy of your laboratory work. However, it must be remembered that the technician comes into the case only on invitation of the practitioner, and your laboratory findings will depend, to a large extent, on the condition of the specimen submitted for examination.

As stated, I have nothing new to offer in regard to methods of diagnosis, but there are a few points that appeal to me so strongly that I venture to bring them to your attention. The first is in the taking of the case history. We all preach the importance of letting the patient tell his own story in his own way, but how many of us actually practice that teaching? I recently listened to a history that, in part, ran as follows: Doctor—"Now tell me what sickness you had while in service." Patient—"About the last of August, 1918, while on the Argonne Front, I had a severe attack of diarrhea." Doctor—"Oh—everybody had diarrhea over there." Thus checked, or, as he thought, reprimanded, the patient did not mention his bowels again until asked, "How are your bowels?" to which he replied, "Sometimes loose, sometimes constipated," and the history read "bowels irregular." It later developed that this patient's chief complaint was alternating attacks of diarrhea and constipation,

due to a severe infection with the *Entameba histolytica*.

It seems to me that we have become so highly specialized that we are unable to take a careful history. The lung specialist hears only those symptoms that may emanate from pathology of the respiratory tract; the neurologist only such as may indicate a lesion in the nervous system or derangement of mental functions; the throat specialist seems to forget that the human anatomy extends below the hyoid bone; the surgeon heeds only such signs as point to the need of an operation; the gastro-enterologist seems to have a firm conviction that all disease has its start and finish between the hyoid bone and the cecum, and all forget that last (if not the chief) end of man, the colon and rectum.

If we could combine the histories taken by all the specialists we would have a fairly complete statement of the case. But this being impractical, and the old-fashioned doctor being obsolete, it would be a good idea to persuade the recent graduate to defer becoming a specialist until he can take a careful history. But this is impractical, because the intern learns to take a history to confirm the diagnosis under which the patient is sent to the hospital. There should be no preconceived diagnosis when a case history is taken.

It would seem presumptuous to say that it is useless to attempt to examine for active ameba a stool that has been allowed to become cool, and yet this seems to be frequently undertaken. I realize that there are experts who say they can find the ameba in cold stools as well as in warm. Unfortunately, very few of us are such experts. I am not a laboratory expert, but I do know that when warm stools are sent to the laboratory the chances of getting a positive report are far better than when a cold stool is sent. I may be over-particular in this matter, but I insist on the stools being examined immediately after passage, while still warm from body heat, and not some hours after, even though they may have been kept warm in a water-bath or otherwise. I do not find it necessary to starve a patient before taking a stool, but I do insist on their taking salts before breakfast and the second stool being sent to the laboratory and immediately examined. Not infrequently the amebæ will not be found until the patient has taken salts for two or three days. When patients are suffering from diarrhea with mucus in the stools the ameba may frequently be found without giving a laxative. A negative report

on a single stool is no more conclusive than a negative report on a single specimen of sputum.

Examination of the lower six or eight inches of the bowel rarely shows any evidence of disease, other than a general congestion that would be expected in any case of colitis. With a long Kelly tube or, as I prefer, a pneumatic sigmoidoscope, we are frequently able to demonstrate ulcers in the sigmoid. In the early stages these ulcers present a mother-of-pearl appearance, but later, when infected with micro-organisms, they present no characteristic appearance. In many cases the ulceration, if present, is too high in the colon to be seen.

The subjective symptoms complained of present the widest range you can imagine, pointing all the way from psychosis to lumbago; and yet if you let the patient tell his own story without "helping him" he will almost always give a history of chronic diarrhea, not infrequently alternating with constipation. I have said these cases will "almost always" give a history of chronic diarrhea, but, contradictory as it may seem, cases with severe infection with amebiasis will sometimes give a history of persistent constipation. Sometimes they will give you as clear a history of ulcer of the stomach as you would care to listen to, but the x-ray will be negative, the stomach content may show hyper- or hypoacidity, but the stools will show ameba and the stomach symptoms will subside with the treatment for amebiasis. Of course the patient may have both a peptic ulcer and amebiasis. I have three such cases under my care at present. I have also had two cases that I treated for peptic ulcer but they did not improve under treatment. Later amebæ were found in the stools and the gastric symptoms subsided under treatment for amebiasis. I had simply made a mistake in my diagnosis of peptic ulcer.

As an illustration of the wide range the symptoms will take I will cite the diagnoses with which a patient was recently admitted to the hospital: "Psychosis, hysteria; constipation; cholecystitis; appendicitis, chronic, mild; tonsillitis, chronic." When I saw that admission sheet I thought "Sounds to me like amebiasis" and it was, the first stool showing numerous active amebæ containing from four to eight red blood cells.

Of the one hundred cases included in this report eighty-nine were born and raised in the tenth district, comprising the states of Minnesota, North and South Dakota and Montana. Of the remaining

eleven two were raised in Illinois, one in Wisconsin, one in Iowa, one in Texas, one in Indiana, one in Ohio, two in Kentucky and two were foreign born.

The source of infection, as nearly as I can estimate from the histories, was: Philippine Islands, eight; Cuba, two; France, chiefly in the Argonne district, sixty-nine; Kentucky, two; on the Mexican border, two; undetermined, seventeen.

The chief diagnoses under which these cases were sent to the hospital are as follows: Observation for a neuro-psychiatric condition, twenty-two; observation for pulmonary tuberculosis, nineteen; observation for gastric ulcer, twenty-nine; observation for cardiac disease, two; observation for tape worm, one; treatment of diarrhea, seventeen; observation for amebiasis, nine. Many of these cases had been in this and other hospitals for "observation for" various other conditions before coming under my observation for conditions given above. Three cases have developed abscess of the liver, one before and two after coming to the hospital.

I shall recite the histories of only a very few of these cases, selecting examples of the various types, as they appeal to me.

As illustrating that type of case not pointing to anything in particular, and especially not suggesting amebiasis:

I. N. E., aged 33, farmer, was admitted May 26, 1923, for observation of a chest and stomach condition. This patient had previously been admitted for observation for a neuropsychiatric condition and on another occasion for x-ray of the gastrointestinal tract and analysis of the stomach content. He was discharged from Camp McArthur, Texas, on account of hyperthyroidism. Since discharge he has suffered from repeated attacks of vertigo and vomiting, coming on about every ten days or two weeks. He has lost about ten pounds in weight. He has frequent headache, is very nervous and irritable and seems worried. Complaints of feeling weak. Bowels are constipated. Examination of lungs negative. X-ray of chest and gastrointestinal tract negative. Basal metabolism plus 31.62. Examination of abdomen gave only slight tenderness along line of descending colon. Examination of feces June 1, 1923, showed active *Entameba histolytica*. This patient was treated for amebiasis. He gained weight, headache stopped, nervousness and irritability subsided and in every way he made excellent improvement. On October 10, 1923, basal metabolism was plus 4.16. Ameba continued in stools up to the middle of January, 1924, after which none were found. He was discharged in April of this year and is now in training. There was nothing in the history of this case to suggest amebiasis, and it serves to demonstrate the importance of systematic examination of stools.

As an example of the "gastric ulcer type" I cite the following:

E. G. G., aged 31, native of Illinois and farmer, was admitted April 30, 1923, for observation for gastric ulcer. In December, 1918, patient had bronchitis and was in the hospital about two months. After leaving the hospital he began having pain in epigastric region. Pains are more severe and persistent during the winter than during the summer months. Pain starts an hour or so after eating. Has eructation of gas and sour matter. Taking food does not relieve pain to any extent. Was treated in ——— hospital from November, 1922, to March, 1923, for gastric ulcer. Has been some better since, but continues to have pain in abdomen and is very nervous. In January, 1922, appendectomy was performed. At present he complains of nervousness and attacks of cramp-like pains in lower part of abdomen, which attacks are followed by diarrhea for two or three days, after which he will be free from pain until he "eats something that upsets his stomach" and causes him to have another attack of pain and diarrhea. He has not been able to find what kind of food it is that causes the attacks, for it "seems to be most anything." Bowels are constipated except during attacks of diarrhea. Physical examination is negative. X-ray of the gastrointestinal tract is negative. Stomach content after a test meal shows a total acidity of sixty-two degrees. Examination of feces May 4, 1923, showed active *Entamebæ histolytica*.

As a sample of the tuberculosis type:

E. B. G., student, aged 27, and a native of Minnesota, was admitted May 31, 1923, for observation for pulmonary tuberculosis. In December, 1918, he was sent to a hospital in Metz on account of diarrhea. After transference to several other hospitals he was finally returned to the States, where he was discharged under a diagnosis of tuberculosis of the intestines. Since discharge he has had frequent attacks of diarrhea. He has cough with expectoration, is weak and easily exhausted. Is very nervous and irritable. Is unable to continue training on account of weakness, nervousness and shortness of breath. Physical examination shows a man somewhat under weight, very nervous and restless. Examination of lungs shows chronic pulmonary tuberculosis, moderately advanced, inactive. Heart is negative. On June 30, 1923, examination of feces showed active *Entamebæ histolytica*. This claimant's general condition improved greatly under treatment for amebiasis and he is now in training and has not, as yet, shown any return of symptoms. Monthly examination of stools occasionally shows encysted ameba, but no active parasites.

As showing the neuro-psychiatric type:

H. E. E., aged 29, farmer and native of Minnesota, was admitted August 19, 1923, for observation of the lungs. In October, 1918, while on the Argonne Front, he was in hospital six weeks on account of diarrhea. In December, 1918, he had influenza and since then he has had bronchitis every winter. Since leaving the service he has had frequent attacks of diarrhea alternating with constipation. He was in a hospital for nervous diseases for six months in 1921. In July, 1922, he was in ——— hospital on account of tonsillitis. He complains of cramp-like pains in lower part of

abdomen with diarrhea, burning of skin ("skin fever"), especially of the face and scalp, headache, nervousness and insomnia. On August 23rd, examination of feces showed active *Entamebæ histolytica*. Under treatment for amebiasis this patient changed from a complaining, whining, discontented individual, going about with his head in his hands and saying he "was burning up," to a bright, happy fellow. He is now in training and shows no subjective symptoms, though encysted ameba are still present on occasional examinations.

As illustrating a history as viewed from different angles:

R. E. S., farmer, aged 25, native of Minnesota, was admitted to the neuropathic ward July 25, 1923, and transferred to general medical ward October 24, 1923. History as taken by the neuropsychiatrist: "Patient states he strained his shoulder and chest lifting a heavy gun in Pekin, China, September, 1918. This strain continued to bother him and he was hospitalized in November, 1918, at the American Legation Hospital, China. Since discharge—returned home and went to farming. Says he has only been able to work about one-half the time on account of headache, weakness and dizziness. Has not worked at all the past year. Has not been treated by any doctor since discharge. Has had about twelve fainting spells since fall of 1920. They last about five or six minutes. Fell off a tractor one day last fall while at work." History of the same case as taken by the internist: "In the spring of 1918 while in the Philippines he had a severe attack of diarrhea, lasting about three weeks. Had blood and mucus in stools. After the diarrhea stopped his bowels became constipated. For about two months, while in the Philippines, he had repeated attacks of diarrhea alternating with constipation and had constant headache and 'dopey' feeling. From the Philippines he went to China. Was there about seven months, during which time the alternating attacks of diarrhea with constipation and headaches with 'dopey' feeling continued. He was in hospital in China for about two weeks on account of strained shoulder. Since discharge—he has been able to do very little work on account of headache, nervousness, vertigo, despondency and attacks of diarrhea, coming on about every six weeks or two months and lasting one or two weeks. During the attacks of diarrhea he will become very weak. Has blood and mucus in stools when he has diarrhea. Has had several fainting spells during the last eight months. His nervous spells are more pronounced when his bowels are constipated."

This patient showed active *Entamebæ histolytica* and has made fairly good progress under treatment, but he still shows some symptoms though active ameba are no longer found in his stools. He has a high basal metabolism and his present symptoms may be due to a hyperthyroidism.

TREATMENT

So far as I have been able to learn, the only thing new in the treatment of amebiasis that has developed in the last decade—if new it can be called—is the return to the use of ipecac in one form or another. The discovery of emetin has made the

administration of ipecac easier. It seems to me that emetin by hypodermic will reach the ameba in the tissues, but by the time it reaches the intestinal tract it will be in such dilute form as to be of little or no avail. Therefore, if we can get the drug into the intestinal tract in a more concentrated solution it appears to me that we will get more prompt results. I am now using emetin bismuth iodide and am considerably encouraged with the results secured. It is, to say the least, not pleasant to take, and some cases cannot tolerate it at all. As to the use of coal oil or quinine enemata, I have found but little choice between the two, and sometimes I wonder if the results secured from either pays for the discomfort and inconvenience they cause the patient. Reports from the use of Chaparo Amargosa were very encouraging for a time. I must confess that I have been disappointed in the results I have secured from its use. When used as a high enema it seems to me that I get some influence on the diarrhea, but I fancy this is probably due to some astringent action of the drug rather than to any specific action. Alcresta Emetin, an emetinated fuller's earth, has given very little result in my hands. I fancy this is due to the fact that the compound is but slightly soluble in either alkaline or acid media. Recently salvarsan has been advocated in the treatment of amebiasis. I have used it in a number of cases and am encouraged from the results secured. In four cases in which I used salvarsan from the start I secured no benefit. In those cases which were pretty well saturated with emetin, but which continued to show amebæ, the use of salvarsan seemed to "help over the hump" as it were and apparently completed the work that emetin seemed not quite able to accomplish.

Recently, I had presented to me a paper on the treatment of amebiasis which gave me the impression that, according to its author, all you have to do to cure amebiasis is to give six grains of emetin by hypo in one grain doses daily and your patient is well "just like that." Not so with my cases. Some of them seem to come along fairly well, but in others the amebæ, like the Ford, just "ramble right along."

When your patient is ameba free, you are not through with him. He does not complain of the amebæ, but of the colitis and other symptoms probably due to absorption of amebic products. Until the amebæ are removed, or at least materially re-

duced, you can have little effect in the treatment of the colitis. But after the amebæ are removed you have a real man's job to treat the colitis and relieve the symptoms that have resulted from a prolonged infection. After he is apparently well and ten to twenty stools, taken at weekly intervals, show negative, he should be examined every two or three months to see if there is any reappearance of the infection. Not infrequently, when your patient is feeling quite well, you will experience a sinking sensation in your gastric region when your laboratory report reads "*E. histolytica* present."

It seems to me that this subject is one of deeper interest than merely academic. If the prevalence of amebiasis among the returned soldiers is as marked as would seem to be from the number of cases that have come under my observation, what is the probability of its becoming prevalent throughout your state unless precautions are taken? In other words, you have the public health problem to consider. If this disease is being overlooked in the returned soldier, as would seem to be the fact from the cases that I have observed, is it not only possible, but probable, that it is being overlooked with equal frequency among those who were not overseas? Certainly you are not giving the returned soldier the short end of the game when you attend him, and a great many of these boys have been under your care as well as under the care of doctors employed by the Government. The last case that came to my ward had been under the care of his family physician for "stomach trouble" ever since his return from the service. Finally, where did these boys get their infection? Are you absolutely sure that amebiasis did not exist in Minnesota ten years ago? Is this a new infection or an old infection just being recognized? The same question applies to Washington, to California, to Montana and the Dakotas. We are receiving cases from Montana and the Dakotas. I believe that careful and systematic examination of stools will show a large number of the boys who were overseas, especially those who were in the Argonne District, to be infected with amebiasis, and I also believe that such examination will show a good many of those who were not overseas to be infected. Even if the infection is entirely new, certainly there has been ample opportunity for infection from the returned soldiers, for, unless my findings are all wrong and unless Kofoid's findings are sadly wrong, several million boys have been scattering

amebæ without restraint for five years and nothing short of a miracle has prevented a spread of the infection; for, so far as I have been able to learn, no precautions have been taken by the health departments.

Finally, I wish to thank Miss Elizabeth Keene, our laboratory technician, for her earnest and efficient services in finding this infection. After all is said and done, we have to depend on our laboratories in making our diagnosis of amebiasis and in checking the results of treatment.

DISCUSSION

DR. McDANIEL (Minneapolis): I think that this paper is very timely, from the public health as well as the clinical point of view. Up to very recently we have all thought of amebiasis or amebic infection in terms of dysentery or as liver abscess following dysentery. The wide variation in clinical symptoms suggested by Dr. Tuttle is very interesting, particularly the symptoms referable to the nervous system which so often accompany digestive tract disturbances.

The magnitude of the public health side of it may be considered in this way. Dr. Tuttle speaks of ten per cent infections among the hospitalized ex-service men. If this ratio should hold for the ex-service men in general we might expect to have about 10,000 amebic carriers in our 100,000 of ex-service men. Dr. Tuttle's figures do not necessarily justify this estimate, but if we remember that Kofoid and Sweezy, mentioned by Dr. Tuttle, found 67 per cent of infections in the ex-service men that had been overseas, who were presumably well students in California, and 26 in ex-service men who had not been overseas, this estimate may be very reasonable. The 3 per cent oriental population of California may possibly be a factor in the wide prevalence of the infection in that state. The reports of Dr. Tuttle, Dr. Dowling and others should serve to put us on guard and lead us to take control measures. Dr. Dowling is of the opinion that those who are supposed to be well but who are carrying this organism may actually be in a lowered state of health. Our tourist visitors who come from infected regions may be a factor in the spread of this infection in our midst.

Walker, who in 1911 first separated *E. histolytica* from *E. coli*, as a distinct species, was the first to demonstrate the carrier condition in relation to *E. histolytica*. With Sellars he experimentally induced dysentery in human beings through the injection of the encysted forms of *E. histolytica*.

The active parasite is an obligate parasite and dies very soon after leaving the body. The encysted parasites, however, which readily develop in the lumen of the intestine, will survive a two or three weeks' sojourn outside of the body, provided moisture is present and they are kept cool. This affords opportunity for the spread of the disease through infected water supplies and infected food in a manner similar to the spread of infection in typhoid and dysentery. We, therefore, have a somewhat similar problem. I will not go into details as to why it is not entirely similar.

Dysentery, both amebic and bacillary dysentery, for years have been on our list of notifiable diseases, reportable to the State Board of Health. We, however, cannot help Dr. Tuttle in answering the question as to the prevalence of amebic infection before and since the war.

Exclusive of the cases reported by Dr. Tuttle we find for the five-year period (1917 to 1923 inclusive) but nine cases including three longstanding cases of amebic infection have been recorded. Two deaths recorded in 1924 raises the total cases reported since Jan. 1, 1917, to ten, one of these deaths having been reported as a case previously. Of the ten cases, seven were reported to the State Board of Health by death certificate only. Eight of these cases were in females, 2 in males. The three chronic amebiasis cases were reported as follows: One from St. Cloud in 1922: Male, age 33; primary cause of death was given as secondary anemia, duration two years; secondary cause, amebiasis, duration two years. The second case was reported in 1922 from Minneapolis: Male, aged 16; primary cause of death, acute nephritis, with uremic convulsions; secondary cause of death, amebic dysentery, ulceration of bowels, duration nine years. The third case was reported by the University Hospital, in a woman aged 35 from Otter Tail County. She was born of Finnish parents in Michigan. No data as to source of infection in these cases were obtained. It is notable that all three cases were reported from localities where excellent laboratory service is available. Dr. Tuttle's paper points out the value of routine examinations of stools both for the benefit of the patient and as a public health measure. In the control of any disease the first step is the diagnosis. The State Board of Health earnestly desires to receive reports of these chronic infections as well as the acute dysentery cases. I believe that as with typhoid fever we should receive a report also of hospital discharge of these patients, giving their destination and statement of the results of treatment and condition of patient on discharge.

DR. L. W. POLLOCK (Rochester): Entamebiasis has been known to be prevalent in the Northwest for some years. Dr. Sistrunk in 1911, Dr. Giffin in 1913, and Dr. Sanford in 1914, wrote of its presence in the Northwest in patients seen at the Mayo Clinic. In 1916 Dr. Sanford in a study of the geographic distribution of entamebiasis, reported in five thousand examinations of feces for parasites the finding of 819 persons in whom entamebæ were found. Of these, 535 patients carried *Entameba histolytica*, and 284 *Entameba coli*. Eighteen per cent of the patients who had stool examination for parasites harbored one of the forms of entameba. Since 1916, the number of patients with entameba infection remains fairly constant. About 5 per cent of the patients coming to the clinic carry entamebæ in their colons.

Dobell, in 1917, in the study of the prevalence of amebiasis in the British Isles, found it to be prevalent there. In a series of cases he examined he found about 4 per cent positive findings, and estimated, on repeated stool examinations, that in 10 per cent of the cases some form of amebiasis was present. This would tend to show that amebiasis is much more widespread than is generally believed.

The types we have to deal with clinically are the *Entameba histolytica*, *Entameba coli* and *Entameba nana*. The *Entameba histolytica* is the pathogenic organism, the

Entameba nana may be pathogenic, and the *Entameba coli* only in heavy infection seems to produce symptoms.

Clinically patients may be simply carriers without symptoms, may have mild recurrent abdominal symptoms associated with diarrhea, or may have true dysentery. A non-symptomatic carrier may, with a debilitating illness, become a frank dysenteric. Ten per cent of the patients have ulceration in the rectum and sigmoid which can be seen by proctoscopic examination. The ulceration is quite typical and conforms to the description given by Dr. Tuttle.

The x-ray study of the colon usually shows, in the filling ray, a normal outline unless there have been secondary changes, due to chronic ulceration and scar formation, when there are irregularities in the colon outline. We do not see the complications with entamebic infection in the Northwest that are seen in the tropical zone. Abscess of the liver is rare although it has been seen. In the treatment, as Dr. Tuttle has said, we can control the acute case quickly and render the patient a carrier, but to free the colon of the entamebæ requires persistence in treatment and time.

Protozoal infections are common in people residing in the Northwest and may produce symptoms. Dr. Tuttle has again called our attention to this fact.

DR. MOSES BARRON (Minneapolis): The prevalence of amebiasis in Minnesota and the surrounding states is rather striking from the statistics cited by Dr. Pollock. That amebiasis might be contracted in Minnesota was called to my attention in 1912 when I studied two cases at autopsy which showed extensive liver abscesses. In neither of these cases was amebiasis suspected since there was no history of diarrhea or other symptoms which might suggest amebic dysentery. At the autopsy smears were taken from the pus in the abscesses and sections were made from the liver tissue adjoining the necrotic material. These slides showed large numbers of entameba histolytica present both in the wall of the abscesses and in the necrotic contents. Very careful histories were obtained from the relatives and in neither case had the patients resided or traveled outside of the states of Minnesota and Wisconsin. Infection must therefore have occurred locally. At that time we thought the infection must have been brought here by the soldiers from the Spanish-American war.

In regard to the statement made by Dr. McDaniels that the motile parasites die soon after being expelled from the bowel and that therefore only the encysted forms can pro-

duce an infection. Walker and Sellards showed conclusively in their experiments in the Philippine Islands that the actively motile form will be killed by the acid contents of the stomach soon after ingestion and that therefore no infection will result. The encysted forms, however, are resistant to gastric digestion and will pass into the intestines unharmed. In their experiments they found that the ingestion of entameba coli produced no symptoms or lesions. Large numbers of Philippine soldiers fed with material containing entameba coli in capsules remained well, but those fed with entameba histolytica developed the typical entamebic dysentery.

DR. TUTTLE (St. Paul): In regard to Dr. McDaniels' statement relative to the cases not being reported; they were not diagnosed correctly, and that is my main point, and I think if the doctors would make a personal investigation and one not done by mail they would find a lot of entameba cases. You can find them, but you won't find them in the postoffice; they don't come that way.

As to reporting these cases and comparing them with typhoid I want to say that typhoid used to kill about 10 per cent of the cases; it doesn't now. Amebiasis puts a man out of commission for three or four years. I would rather die now than be out of commission for years. I have a boy in the hospital whose salary is \$250 a month, every day he can work. Now he is getting \$80 a month, and he wants to get back to work. This man has been cleared up of his *Entameba histolytica*, but he has no pep. He says, "I break right down. I get mad at my customers," and that is an important thing to consider. If I had reported 100 cases of typhoid fever Dr. Chesley would have been on my neck in fifteen minutes. But nothing is done about amebiasis. These are strictly *Entameba histolytica* cases. This report does not include cases that were examined after staining and only cysts were found. It includes only those in which the red blood cell was found in the ameba. We have found a large number infected with *E. coli*, but they are not included. This *E. coli* may be non-pathogenic, but I don't want it in my intestinal canal.

The symptoms are misleading, as shown by the diagnoses under which cases are sent to the hospital. One case from the N. P. ward just complained of being dizzy. One patient was afraid he was going to die of cancer of the stomach because his father died of that. We had to watch him to keep him from committing suicide. That boy today is doing very well.

B. PAUL'S HENNA AND LIQUID HAIR DYES

Two hair dyes are put out by one Paul Balme, who does business in New York City under the name "B. Paul." One of these dyes is known today as "Paul's Henna" and is a powdered mixture. The other, put out by the same man, is called "B. Paul's Liquid Mixture." B. Paul's Henna comes in a tin can and is claimed to be " * * * a powdered preparation composed of pulverized henna and herbs which will color gray hair to any one of our fourteen different shades." Accompanying this powder is a small envelope containing a white powder and labeled "B. Paul's Developer: to set the shade." For use, the hair

must be washed, the powder applied in the form of a thick paste and left on for from thirty minutes to two hours; the hair is then rinsed and treated with a solution of the "developer." The A. M. A. Chemical Laboratory reports that the "henna" powder consists essentially of dried plant leaves, pyrogallol, iron and copper compounds, and that the "developer" is sodium perborate. The Laboratory also examined the liquid preparation. The preparation was contained in two bottles: one was essentially a solution of the well-known copper ammonium sulphate, the other was a solution of pyrogallol. (*Journal A. M. A., Nov. 1, 1924, p. 1449.*)

THE PRESENT STATUS OF MILK PASTEURIZATION IN MINNESOTA

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Pasteurization is universally recognized as the most dependable and economical method of rendering milk safe for human consumption. Health authorities agree that all market milk should be pasteurized unless it is produced and handled under conditions similar to those required for certified milk. The process is applied primarily for the purpose of overcoming certain dangers from the transmission of communicable diseases through raw milk which may not be eliminated by even the most intensive dairy and medical inspection. One cannot always be sure that the dairy cow, and all persons engaged in the production and handling of the milk, are free from communicable diseases at all times. In cities where all the milk supply is properly pasteurized, outbreaks of milk-borne diseases have been eliminated. The United States Department of Agriculture makes the statement that "no epidemic of disease has ever been traced to properly pasteurized milk." Pasteurization is also an important economic measure in that it makes it possible for cities to maintain a safe milk supply at a price within the reach of the average consumer.

The marked increase in the amount of milk pasteurized in the United States is largely an indication of an appreciation by the public of its value as a health measure. An average of more than 95 per cent of the milk is pasteurized in the cities of the United States with a population of 500,000 or more. In Minnesota, an average of more than 50 per cent is pasteurized in cities of a population of 5,000 and over. One city in the state has adopted an ordinance that requires the pasteurization of all milk. Every year shows an increase in the number of pasteurization plants and in the amount of pasteurized milk consumed.

The term pasteurization as applied to milk means heating it to a temperature of not lower than 145° F. for not less than thirty minutes. This does not render the milk sterile, but destroys the disease-producing bacteria.

Pasteurization does not change appreciably the chemical composition of milk. Pasteurized milk tastes practically the same as raw milk and the food value is not materially affected, with the possible exception of a partial destruction of one vitamin. There is little known of the real chemical nature of vitamins except that they are necessary for normal growth and health. Milk contains all three vitamins and the effect that pasteurization may have on them is of importance. Fat-soluble vitamin A and water-soluble vitamin B are quite resistant to heat and it is agreed that pasteurization has little or no effect upon them. The antiscorbutic vitamin C is sensitive to heat at about 122° F. While the destruction of this vitamin depends upon various factors, such as oxidation, temperature, etc., pasteurization undoubtedly weakens the antiscorbutic property of the milk to some extent. It has been found that milk freshly drawn from the cow at certain times of the year does not always contain a sufficient quantity of vitamin C to protect against scurvy. This variation in the vitamin content of the milk is influenced by the kind of food which the cow receives. Since even fresh, raw milk may not contain a sufficient quantity of vitamin C most physicians recommend that this vitamin, which is present in orange juice, tomato juice, etc., be added to the child's diet when cows' milk is substituted for breast milk. In view of the fact that vitamin C must be substituted in the infant's diet regardless of whether or not the milk is pasteurized, a partial destruction of this vitamin resulting from pasteurization is of little practical importance. Since adults do not depend on milk as a source of vitamin C, pasteurization cannot be said to have a detrimental effect on the food value of milk insofar as they are concerned.

The Minnesota State Board of Health has supervised the pasteurization of milk since 1917, when a survey was made of all pasteurization plants in the state, not including those in Minneapolis, St. Paul and Duluth. Investigations, including a field survey and bacteriological examinations, were made at thirty-two plants. It was found that pasteurized milk was sold in all but seven cities in the state with a population of 5,000 and over and that the word "pasteurized" was used largely as a trade name. The methods of pasteurization as carried out at many plants had practically no significance from a health point of view. For instance, at five plants milk was found labeled as pasteurized

where there was no pasteurization apparatus and no attempt was made to subject the milk to a heating process. None of the plants were provided with recording thermometers to show the temperature to which the milk was heated and the length of time it was held, and the pasteurizing temperature varied from 135° F. to 185° F. At a number of plants the milk was sold as pasteurized throughout the year, but was only heated during the summer months for the purpose of improving its keeping qualities. The survey indicated conclusively that the mere presence of pasteurizing equipment at a plant or the fact that the product was labeled "pasteurized" did not insure safe milk. It was further evident that if the pasteurization of milk was to be of value from a health point of view, definite standards for the process must be prescribed and enforced at every plant. As a result of the survey, the State Board of Health passed regulations defining the pasteurization of milk in Minnesota and outlining the requirements which must be complied with at pasteurization plants.

The following is a list of some of the essential requirements which plants must comply with in order to meet the regulations of the State Board of Health:

1. *Building:* The building in which the plant is located should be properly lighted and ventilated. Separate rooms for pasteurization of milk and washing utensils should be provided. Raw milk delivered to the plant should not be unloaded directly into the pasteurizing room. All floors should be constructed of impervious material and should be sloped to drains and gutters of adequate size. Suitable toilet facilities should be available for use of employees. Hand washing facilities with soap and clean towels should be provided. The entire plant should be maintained in satisfactory sanitary condition and should be effectively screened against flies.

2. *Heaters and Holders:* The apparatus should insure the heating and holding of the entire quantity of milk at a temperature of not lower than 145° F. for not less than thirty minutes. The equipment should be as simple as possible in order to insure proper operation, and so that it can be effectively cleaned and sterilized.

3. *Thermometers:* A recording thermometer should be provided to show the temperature to which all milk is heated and the length of time held. The thermometer charts should be dated and

changed daily and the chamber kept locked. The thermometer should be checked at frequent intervals to determine its accuracy.

4. *Coolers and Storage:* Facilities should be provided for promptly cooling the pasteurized milk to 50° F., or below. Open surface coolers should have a tightly fitting cover. The refrigerator should insure the storage of the milk at a temperature below 50° F.

5. *Bottle Filler and Capper:* A machine filler of an approved type should be provided. Caps should be placed on the bottles with a machine capper of the hand or automatic type. They should be placed in the capping machine in the original tubes in which they are received from the manufacturer. Pasteurized milk should be placed in the containers in which it is to be delivered immediately after it is cooled.

6. *Pipes, Pumps, Fittings, Valves, and Covers:* The pumping of milk after it is pasteurized should be eliminated as far as possible. Pumps should be an approved sanitary type, and constructed of non-corrosive material. They should be so designed that they can be readily taken apart for cleaning. All pipes, fittings and valves should be of the sanitary type, and should be so constructed that every part can be opened. The use of blind or closed elbow joints is prohibited. The arrangement of the plant and the location of the equipment should be such that the amount of piping is reduced to a minimum. By-passes and cross-connections in the pipe line are not permitted. Pasteurized milk should not be passed through pipes and pumps which earlier in the run are used for unpasteurized milk. All apparatus in which milk is stored, pasteurized, or handled, should have proper covers to prevent exposure.

7. *Cleaning and Sterilization of Pasteurization Apparatus:* The entire apparatus, including all pipes, pumps, etc., should be taken apart each day and thoroughly washed. After reassembling, and just prior to the run, they should be effectively sterilized.

8. *Bottles and Cans:* Facilities should be provided to insure effective sterilization of bottles and cans. After they are sterilized the bottles should be stored in the cases in an inverted position until ready for use.

9. *Medical Examination:* All persons in pasteurization plants engaged in the pasteurization or bottling of the milk, or cleaning or sterilizing of

milk apparatus and utensils, should pass the medical examination prescribed by the State Board of Health to determine that they are not chronic carriers of infectious diseases.

The routine work carried out by the State Board of Health in the supervision of the pasteurization of milk consists of:

(1) The examination of plans for proposed pasteurization plants or changes in existing installations. The regulations of the State Board of Health provide that no plant shall be installed for the pasteurization of milk or any existing plant materially altered or changed until complete plans and specifications for the installation, alteration, or extension have been submitted and approved by the Board.

(2) Investigation of new plants after completion to determine that the building and equipment have been constructed and installed in accordance with the approved plans.

(3) Routine investigations at existing plants in company with the local officials to determine that the equipment, methods of pasteurization, and sanitary conditions comply with the regulations of the State Board of Health.

The daily routine inspections made to determine whether proper methods of pasteurization are being carried out is a function of the local health department, since it is impossible for the State Board of Health to assume the responsibility of detailed supervision. Legal authority is necessary in order that the local officials may properly supervise the pasteurization plants. This authority must be provided by the passage and enforcement of a local milk ordinance. An ordinance for cities not in Class 1 has been prepared by the various state departments interested in milk supervision and the State Board of Health and the other departments have taken active steps to induce municipalities to

adopt it. The co-operation that local authorities have extended in this work has been very gratifying. In 1917, only two cities in the state outside of those in Class 1 had effective local supervision of the milk supply, while at the present time more than seventy-five cities have adopted the approved ordinance with the changes necessary to meet local conditions. The supervision work on pasteurization since the passage of the regulations by the State Board of Health has resulted in a marked improvement in the safety of pasteurized milk. There are now fifty-two plants located in thirty-one cities, not including Minneapolis and St. Paul, where the building and equipment and methods of pasteurization have been approved by the State Board of Health. Plants that do not comply with the regulations are ordered to discontinue labeling, advertising, or selling their product as "pasteurized" until the unsatisfactory conditions have been eliminated.

A summary of the bacteriological examinations at the plants shows that in 1919 no samples were obtained with bacterial counts under 25,000 per c.c., while in 1923-1924, 20 per cent of the samples were under 10,000 per c.c. and 52 per cent were under 25,000 per c.c. In 1919, 88 per cent of the samples had a bacterial count of more than 50,000 per c.c., while in 1923-1924, only 17 per cent exceeded this figure. The high counts found in 1923 and 1924 were the result of improper methods of operation of the plants, and these conditions were remedied at once or the plants were ordered to discontinue the sale of pasteurized milk.

The most urgent need at the present time in the improvement of market milk in Minnesota is a greater appreciation by the public of the importance of a safe milk supply, and with this a better understanding of pasteurization and of its merits as a health measure.

AOLAN NOT ACCEPTED FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Aolan is prepared from milk freed from fat and is claimed to be a germ-free and toxin-free solution of lactalbumen, manufactured in Germany for the H. A. Metz Laboratories, Inc. The use of Aolan is recommended by intramuscular and intravenous injection in a large number of conditions. The Council found Aolan inadmissible to New and Non-official Remedies because it is marketed under unwarranted therapeutic claims. When the Metz Laboratories was in-

formed of the Council's decision, the firm sent a detailed reply. After considering this reply, the Council decided that the rejection of Aolan should stand. The Metz Laboratories, Inc., does not hold itself responsible for the many and varied claims made for non-specific protein therapy and the uses of Aolan in connection therewith which have appeared in print. Although the claims advanced by the American agent are relatively moderate, they are still unacceptable, because they are unsupported by controlled clinical evidence from reputable observers. (*Journal A. M. A.*, Nov. 8, 1924, p. 1526.)

ROUTINE EXAMINATION AND MANAGEMENT OF THE NEWBORN*†

OLIN W. ROWE, M.D.

Duluth, Minn.

About eight years ago the section on Pediatrics of the Duluth Clinic undertook the daily examination and management of the babies born on the obstetrical service, with the hope of establishing a routine which would favorably influence the high morbidity and mortality of the first weeks of life. The most essential points to be secured were recognized as: (1) breast feeding; (2) protection from infection; (3) normal temperature; (4) the early recognition of abnormalities when existing; (5) prompt treatment when necessary. Our results, and those of other clinics and hospitals with a similar service, show that much has been accomplished, and with improved technic and increasing knowledge that the ideal may be approached, if not actually reached. The purpose of this article is to outline the general plan followed, list some of the conditions encountered, and discuss briefly some phases of these which seem of interest.

The necessity of establishing a service wherein the newborn receives a thorough examination immediately after birth and daily observation during the period immediately following, has long been recognized, and is so obvious that discussion is unnecessary. Emphasis is necessary, however, on the close relationship and co-operation that must exist between the obstetrician and the pediatricist when the work is done by two different services. In general practice the same routine can be followed and like results obtained if the physician is willing to devote the necessary time. Wide experience and special training are desirable, but not necessary, in order to make satisfactory examinations. Every physician should be familiar with the characteristics of the newborn and capable of recognizing deviations from the normal.

ROUTINE CARE

Our routine care is as follows: As soon as the cord is tied (occasionally before), a 1 per cent silver nitrate solution is dropped into each eye. The temperature is taken and the body cleansed with warm olive oil. The child is then weighed,

dressed in warm clothes and wrapped in a warmed blanket. The temperature is taken every four hours. When necessary, the infant is placed in a cubicle in our newborn ward, which may be heated to any desired degree and in which the proper humidity may be maintained. The bleeding time and coagulation time is taken daily for the first three days. The Rodda technic for determining the coagulation time is employed.¹

The baby is put to the breast once or twice in the first twenty-four hours if the condition of the mother permits, and it is nursed every four hours, five times daily, after the first twenty-four hours. This feeding schedule is adhered to in the average case. Some sick infants, prematures, and an occasional normal baby, require different feeding intervals, and a modification of our routine is made when indicated.

Daily baths are given when the condition of the infant permits. The spray from a tank, accurately regulated as to temperature and force, is used.

The babies are kept in metal baskets and are removed only when necessary to bathe, feed, dress or examine.

The same aseptic technic followed in the operating room is used in the nursery. Water is given at regular intervals. The prematures get a quantity of water equal to 10 per cent of their body weight. Prematures and weak babies are fed from the breast when possible, but by tube if necessary. If the mother is unable to nurse her baby, breast milk from other mothers on the service or from the Breast Milk Dairy is given. Occasionally complementary artificial food is necessary, and then a whole lactic milk with corn syrup is used. All prematures are given small doses of cod liver oil after the first week.

The baby, chart and stools are inspected daily. This permits an early recognition of untoward conditions which develop after the first day, and the prompt practice of preventative pediatrics.

Recently the records of 638 newborns were reviewed. These were of consecutive births, except that records of stillborn infants and those dying in the hours between birth and the first visit of the pediatricist were excluded. Abnormalities, with the exception of mastitis, icterus neonatorum, and a few other conditions which seemed to have no bearing on the progress of the infants examined, were noted. All of the mothers were private patients and had been under the care of an obstetrician for

*Read before the annual meeting of the Minnesota State Medical Association, St. Cloud, October 10, 1924.

†From the Section on Pediatrics, The Duluth Clinic, Duluth, Minnesota.

varying periods, usually extending over many months. The economic level of the parents was well above the average.

The birth weight is one of the most important observations recorded. While it is only one of the factors concerned in the velocity of growth it is the one most frequently consulted.

The average weight of the 327 boys was 3,374 grams. The average weight of the 311 girls was 3,161 grams. These weights are lower than those recorded by Faber² for the same number of infants in a San Francisco clinic. They approximate the figures of Holt and some other observers in different sections of the country.

The following figures are the averages for the series: The weight loss following birth was 6.5 per cent of the birth weight. The lowest weight was reached in two and one-half days. The birth weights were regained at four and one-half days. Some of the variations from these averages were very wide in apparently normal babies.

We have come to regard a weight loss of more than 7 per cent and a failure to regain birth weight by the fifth day as not necessarily abnormal, but when occurring should immediately attract attention and arouse suspicion of possible abnormal physiologic or nutritional conditions.

INCIDENCE OF ABNORMAL CONDITIONS OCCURRING IN THE 638 NEWBORN INFANTS EXAMINED

Number

- 1—Double Talipes Equino Varus
 - 1—Amyotonia Congenita
 - 1—Cystic Kidney
 - 2—Monsters
 - 3—Accessory Digits
 - 2—Mongols (1 with congenital dislocation of hips)
 - 1—Atresia of Common Bile Duct
 - 1—Dermoid of Buttocks
 - 4—Spina Bifida
 - 1—Atresia of Esophagus
 - 1—Hydrocephalus
 - 2—Imperforate Anus
 - 1—Atelectasis
 - 1—Infection of Navel (Diphtheria)
 - 1—G. C. Conjunctivitis
 - 18—Premature
 - 32—Fever (Anhydremia)
 - 2—Fractures
 - 1—Meningitis (Bacillus Coli Communis)
 - 4—Obstetrical Paralysis
 - 6—Hypertrophy of Thymus
 - 9—Traumatic Hemorrhage

{	3 Sternomastoid
	4 Cephalhematoma
	2 Cerebral
 - 12—Hemorrhagic Disease
- Twins were encountered 11 times.

FEVER IN THE NEWBORN

In the early cases of this series a temperature exceeding 101 degrees Fahrenheit was encountered in 12 per cent of the babies at some period between the second and sixth day. This was regarded as an inanition fever. The high percentage was a direct result of enthusiastic efforts to establish breast nursing in all infants. In a short series that were fed high sugar solutions and expressed milk in sufficient quantities to prevent the normal initial weight loss, no fever was observed. It was also noticed that infants losing less than 7 per cent of their birth weight did not show an abnormal temperature. This seemed to bear out the supposition that we were dealing with an inanition fever. A routine was therefore established of complementing the milk obtained by the baby from the breast with sufficient expressed milk or modified cow's milk to bring the total caloric intake above one hundred calories per kilogram of body weight. Under this regime the babies ran a normal temperature.

Marriott's³ work on anhydremia has convinced us that this temperature is not a result of too little food, but is due to a drying of the tissues and body fluids. He has shown that the newborn infant has a very high water requirement, which if not met results in a marked degree of desiccation. This drying-out process is accompanied by fever.

Bakwin, Morris and Southworth⁴ have shown that infants exhibiting this fever have a protein concentration of the blood serum exceeding 7.5 per cent, whereas the normal is rather constant, lying between 6 and 7 per cent. When they gave fluid per mouth, in the proportion of from 30 to 40 c.c. per kilogram of body weight; a prompt fall in temperature and blood concentration followed with great regularity, the temperature usually reaching normal within from thirty to ninety minutes.

While we were slow to attribute the success of our treatment to the control of anhydremia, we found that only slight changes were necessary in our routine. The babies are weighed daily. If the weight loss is unusually rapid on the first or second day, or if the weight loss for the first three days exceeds 7 per cent of the birth weight, complementary food is added in sufficient dilution to make the total intake of fluid equal 10 per cent of the body weight, and of sufficient strength to furnish at least one hundred calories per kilogram of body weight.

If the fever still persists, the cause is probably one of the various infections.

IMPERFORATE ANUS

When the intervening tissue between the pelvic rectum, growing downward from the caudal end of the hind-gut and the proctodeum, developing from a plate of epithelial cells at the site of the future anus, fails of absorption, a condition described as "imperforate anus" results. Two such cases were encountered.

In the first baby the rectum ended in a blind pouch, approximately three centimeters from the site of the anus. The normal musculature of the anus was lacking, but a few fibers were found at operation. The rectum could be felt impinging on the fingers when the baby strained. Operation was successful.

The second baby had a fistulous opening into the vagina, about midway of the perineum. Operative treatment was considered unnecessary and inadvisable at this time, as the fistula was sufficiently large to allow free emptying of the bowel. The technical difficulties encountered later, when a plastic operation was made, proved that this was good judgment. The baby, however, developed a cystitis, and later a pyelonephrosis, which was extremely obstinate.

INFECTION OF THE NAVEL

Infection of the navel, of sufficient severity to produce marked inflammatory reaction, was encountered in only one case in this series. This is attributed to the simple routine treatment, which is as follows: The cord is cut extremely short, and the stump is painted with iodine and covered with a sterile dressing. This is inspected daily. More recently the clamp devised by Ziegler has been used.

The one baby developed a marked swelling of the tissues about the navel, without much induration, but with considerable exudate with a foul odor. Direct smears did not show diphtheria bacilli, and the case was not correctly diagnosed until the obstetrician reported diphtheritic pharyngitis in the mother. One injection of diphtheria antitoxin hastened healing.

Examination for diphtheria bacilli should be made in all cases of suppurative infection of the umbilicus.

Occasionally a small granulomatous tumor is found in the umbilicus after the separation of the stump. The surface of the tumor is irregular, red, and frequently covered with a serous fluid. Heal-

ing is delayed. Cauterization with a 10 per cent silver nitrate solution is usually all that is necessary, but the larger tumors may need ligation.

OPHTHALMIA NEONATORUM

It is interesting to note that one case of gonorrheal conjunctivitis developed in spite of the usual silver nitrate treatment. Fortunately it was mild in degree, and responded rapidly to the accepted treatment. The fact that this infection can occur under such conditions is of especial significance to hospitals which keep all the newborn in one ward and depend entirely on the Credé treatment for prophylaxis. This experience has made daily examination of the eyes a part of our routine.

Occasionally a non-specific conjunctivitis is seen. These cases are characterized by edema, photophobia, and a small amount of discharge, which may be purulent. This is regarded as a result of mechanical causes or secondary to irritation caused by the Credé treatment. Mild boric acid solutions were used with excellent results.

OBSTETRICAL PARALYSIS

Obstetrical paralysis (a paralysis produced during birth) is due to an injury of the brachial plexus. The paralysis following such an injury is characteristic: the arm hangs limply by the side, the forearm pronated, and the whole arm inwardly rotated. The paralysis is usually flaccid.

The condition is easily recognized. A flaccid paralysis limited to a peculiar group of muscles occurring in the newborn can scarcely be confused with that of cerebral origin. A peculiarity is that the triceps is not affected, so the power to extend the forearm remains, although it cannot be flexed.

The commonest form of obstetric paralysis is the well known upper arm type or the Duchenne-Erb type, first described by Smellie in 1768, but first brought prominently before the medical profession four years later by Duchenne, who described four cases in infants. This is often called "Erb's paralysis," incorrectly, however, since Erb's description was of a similar condition in the adult, produced by injury to the fifth and sixth cervical roots.

A rather rare form of this paralysis is known as the lower arm, or "Klempke" type, which is concerned with a disturbance of the lower roots of the brachial plexus, the seventh and eighth cervical and first dorsal root, and gives rise to disturbance

chiefly along the distribution of the ulnar and median nerves.

A combination of these two types may occur and be of such severity as to result in complete paralysis of the arm.

In our series there were four cases. All were breech presentations or podalic versions, and implied the application of force, with marked muscular relaxation of the child. Three were of the upper arm type, and one was of the combined upper and lower arm type.

While the extent of the injury is the greatest factor in the prognosis, promptness of treatment is next in importance. This cannot be too strongly emphasized. In children with approximately the same degree of paralysis as those of this series, but who came under observation at periods of from three weeks to two months after birth, the results were not so satisfactory and the time treatment was necessary and was materially prolonged.

We have put all of our cases up in splints and kept the arm warm.

The position in which the arm is held is as follows: The arm is elevated away from the body at an angle of 90 degrees. The forearm is flexed at right angles, with external rotation. The essential point is external rotation of the arm at the shoulder, and fixation. This position prevents further injury to the plexus, allowing the nerves in the surrounding tissues every opportunity for repair. It prevents contraction which results in the deformity known as "policeman's tip," and avoids muscle stretching, with its attending atrophy.

Massage has no place in the treatment during the first few weeks.

I am convinced that prompt recognition and the application of the splint will be all that is necessary in the milder cases of the upper arm type, that it will render the greatest service in the severer cases, and will materially reduce the number of children needing the services of an orthopedist later.

THYMUS HYPERTROPHY

The clinical diagnosis of this condition is possible, but it should always be confirmed by the roentgen ray. The condition is suspected in all cases of difficulty in establishing normal respiration, in attacks of recurring cyanosis and in convulsions. The roentgen plate should be made at the end of expiration, when the thymic shadow is largest.

Fluoroscopic observation is of decided importance, as it more clearly shows the size of the organ and its fluctuation during respiration—particularly forced respiration, as produced by crying.

Eight of our babies presented clinical symptoms attributable to thymic disturbance, making closer study necessary. Six of these showed definite shadow in the region of the thymus. This small number, in the light of Peterson's⁵ recent studies, indicates that only the babies with pronounced symptoms were recognized as having possible thymic enlargement. Many cases were undoubtedly overlooked. One reason for this may be that respiratory delay is frequently encountered by the obstetrician but the condition is overcome by the time the pediatricist makes his examination, and in the absence of a definite history no trouble is suspected.

All babies in our series, with proven thymic hyperplasia, were treated by the roentgen ray. The technic of the treatment is as follows:

The child is given 5 milliamperes at a 7.5 inch spark gap for from three to five minutes per area. Two areas are used—one on the chest and one on the back—the target skin distance being ten inches, with a filter of 4 millimeters of aluminum. About fifteen minutes per area per three weeks is the maximum safe dose. This, however, is seldom required, improvement being noted after three-minute applications to the chest and three minutes to the back. The thyroid gland must be safely protected by a shield.

In every case treated the symptoms promptly disappeared.

No treated case has developed symptoms attributable to the thymus.

Some of our experiences in older children, with sudden death attributable to dyscrasias of the thymus in association with infections, have been reported by Kohlbry.⁶ These, and similar experiences, with sudden death in association with the first severe infectious process, operation or injury occurring in patients with demonstrable thymic disturbance, make me conclude that all cases showing definite thymic enlargement should be treated by the roentgen ray, in order that potential dangers from thymic dyscrasias be eliminated.

HEMORRHAGE

So much has been written on this subject during the last few years that no extended discussion is

necessary. Of the hemorrhages occurring in this series, the first nine were considered to be due to injury, history of injury having been obtained, and no changes in the bleeding or coagulation time observed. Subcutaneous injections of blood were given, not only for the immediate effect, but also as a prophylactic measure against the possible development of the hemorrhagic disease. Two of the hemorrhages into the sternomastoid were diagnosed on the first day. The third escaped observation until later. It was thought at the time that this hemorrhage occurred late, but it is more probable that the soft, diffuse mass was not discovered in the short, fat neck until after organization of the clot had taken place. In the last fourteen cases marked changes in the coagulation time were ob-

tions were repeated if symptoms of hemorrhage appeared. In one pair of twins, one baby bled extensively, while the other remained normal. In another pair of twins, one showed extensive hemorrhage forty hours before the other developed symptoms suggesting cerebral hemorrhage.

It is very probable that small cerebral hemorrhages occurred in some babies in this series and were unrecognized. We have found the condition at times very elusive. The clinical picture is usually very sharp, but repeated spinal punctures are done on all babies presenting indefinite symptoms not attributable to other causes. Hemorrhages occurring into the brain tissue may not show a bloody fluid on spinal puncture. The use of the spinal mercurial monometer has not been of the assistance

ST. MARY'S HOSPITAL

Date of Exam.

Name		Address			Date and Hour of Birth			
Male	Female	Weight	Length	Head	Chest	Abdomen	A. Font.	Tension
Treatment: Eyes		Cord						
General Condition								
Anomalies or Injuries								
Date _____								
Coagulation Time _____								
Bleeding Time _____								
Term	Premature at		Stillborn					
Examination on Discharge:	Weight	Gaining		Stationary	Losing		Gen. Condition	
Skin	Eyes	Genitals						
Breast	Navel							

This is the blank used for recording examinations of the newborn. On the reverse side is the first temperature and weight chart.

served in all but one. In this baby both visceral and cerebral hemorrhages were very extensive. The hemorrhages were regarded as due to changes occurring in the blood described as the hemorrhagic disease, although the coagulation time was within normal limits on three consecutive days, as determined by independent observers.

In three families the hemorrhagic disease appeared three or four times. Needless to say, babies born to parents presenting this history received subcutaneous injections of blood at birth from donors outside the immediate family. The injec-

ected. In the presence of a normal reading and a clear spinal fluid, blood should be given if symptoms, possibly due to cerebral hemorrhage, persist.

I wish to express my appreciation to Dr. W. A. Coventry for his active co-operation in this work and to Dr. C. O. Kohlbry for numerous physical examinations.

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DISCUSSION

DR. F. C. RODDA (Minneapolis): I feel very much indebted to Dr. Rowe for the very nice presentation of a subject which is very important. Fifteen or twenty years ago very little attention was paid to the new-born. If it died, no effort was made to determine the cause, and if it survived to eventually show a displaced diaphysis or Little's disease it was charged to accident. The first work was done by Von Reuss in Vienna about 1910, and in 1912 Dr. Sedgwick with Dr. Litzenberg's co-operation established at the University of Minnesota a new-born clinic. Now we have them in a great many different universities throughout the country. There is growing up in the medical literature at the present time a large amount of material on diseases of the new-born, and although we have learned and gleaned a few things it is still a virgin field. One of the first things we found on our post-mortem examinations at the University was that somewhere about 40 or 50 per cent of all the deaths of the newly born that lived for two or three days were due to a cerebral hemorrhage, and this at once brought out the importance of this subject. We feel that a routine examination does not need to be exceedingly intricate. It is largely a matter of inspection of the babies and the observation of the patients during the first few days of life.

There are just one or two things that I would like to speak of. One is the question of thymus. A few years ago we recognized a status lymphaticus in those individuals who died suddenly without apparent cause. Now we are finding a great many conditions: difficult nursing, babies having sinking spells, babies having convulsions, difficulties in respiration due in many instances to an enlarged thymus. We are finding quite a large percentage of cases of enlarged thymus, not as large as Dr. Peterson has reported, but still enough to make up a considerable series. We have obtained brilliant results in the relief of these symptoms by the simple application of x-ray or radium. In our experience the x-ray has given the better results.

Just a word about hemorrhagic disease. In order to get any results we should have a very early recognition and very prompt treatment. We noted one or two things recently in connection with this. Occasionally we do not get the brilliant results that we have anticipated or had in certain other cases, and we have found it distinctly advantageous in several cases to change the donor. We haven't carried out any tests as yet to show any chemical changes or differences in the blood of the donors, but we have had instances where no relief has been afforded by giving the

mother's or the father's blood but when shifting over to another donor, for instance the uncle, we have had very satisfactory results.

The so-called impetigo of the new-born is a very troubling condition with those who have occasion to use hospitals. There have been violent epidemics which alarm the mother and are thought by the mother to be a contamination of the child by a careless nursing. We have found that little can be done by isolation, that they heap up in an epidemic wave. Some work has been done during the last year or two, and I feel that very presently we will be able to explain this. These cases are due to a very particular strain of the staphylococcus. I believe that practically all these cases are concerned with a carrier,—nurse, mother or individual who is harboring this particular strain in the skin and transports it to the child. I feel that more can be done to prevent the prevalence of impetigo of the new-born. Though it is not serious as far as the baby's life is concerned, an epidemic brings great discredit to the obstetrician, the pediatrician and the hospital concerned.

DR. W. R. RAMSEY (St. Paul): This subject is a tremendously interesting one and is very vital. It isn't sufficient any more that the obstetrician or the practitioner hand over a seven or eight pound baby to the grandmother and say, "This baby weighs seven or eight pounds and is quite normal," without thoroughly examining the child. Dr. Rowe covered this field so very well that I am just going to mention one or two points which are so common that we have all seen them.

To illustrate how very important it is to make a really searching examination and to take into consideration all the facts, I just happen at the present moment to have a young child two and one-half months old under observation at the children's hospital. Like some 33 per cent of the normal children it had icterus neonatorum. When it came from the hospital at the end of eight or nine days the jaundice had almost disappeared and the stools were yellow in color. Then the jaundice began to increase and since then for two months the baby has been jaundiced with no bile at all in the stools. They were absolutely white. The condition was assumed to be a congenital obstruction of the bile ducts, but the fact that there was bile for a period, demonstrated that it probably was not. All that I did was to make some rather deep manipulations over the gall bladder, and the next day the stools were again yellow and the jaundice is clearing up, showing that the obstruction was probably due to adhesions from an infection through the umbilicus.

A very common thing and one that the medical man, without exactly neglecting it, often overlooks in his hurry is conditions that interfere with the nursing. The baby is not nursing normally and the mother, or the nipples or the milk are blamed. When a careful examination is made it frequently will reveal some abnormality in the breathing apparatus, not infrequently a complete blockade of the post-nasal space by adenoid tissue or some abnormality of the tongue or some part of the sucking apparatus.

The subject of congenital heart conditions is interesting. The sounds are not infrequently normal, so that the doctor is not always to be blamed if he does not detect one of these congenital hearts.

The subject of undescended testes which was mentioned today is most interesting and is very frequently overlooked. It is rather embarrassing for the doctor to have the child examined six months later by somebody else and to have him tell the mother that the baby has one or both undescended testes.

On the question of thymus there has been a lot of interesting work done and the x-rays shown by Dr. Rowe have been extremely interesting. There is one point which was brought out very well by Dr. Gertstenberger, of Cleveland, in pictures that he showed some years ago, which I happened to see, of a case that was thought to be a thymus enlargement, in which the thymus seemed to show very definitely. He found, however, that it depended on when the picture was snapped, whether during inspiration or expiration, whether the thymus showed in the x-ray. The treatment by the x-ray is efficient but I just want to caution you against the over-enthusiasm shown by some people since an article was read at the last meeting of the American Medical Association. One enthusiastic member of the profession down East is advocating treating all children with the x-ray to prevent enlargement of the thymus. I think Dr. Rowe's paper excellent and I am very glad to have heard it.

DR. AUGUST KUHLMANN (Melrose): I would like to ask Dr. Rowe what treatment he used with this spinal hernia or spina bifida as you call it, and what results he had.

DR. O. W. ROWE (Duluth): In answer to the last doctor will say that all cases of spina bifida that are amenable to surgical treatment are operated. This means approximately 10 per cent give good results. I believe that the technic is that of other simple hernias. Our cases are referred to the surgical division as I am a pediatricist and not a surgeon.

I am deeply indebted to Dr. Rodda for mentioning the hemorrhagic disease. Anything that he says on the subject is of course authoritative. We use blood frequently as a prophylactic measure in difficult or prolonged deliveries and for families giving a history of bleeding. One of these had four consecutive children that were bleeders, and another three. These were given blood from donors outside the immediate family at birth.

Dr. Ramsey brought up the question of when the roentgen plate is made. It is taken at the end of expiration, and a fluoroscopic examination is also made. That latter is really quite important. You can catch the thymus by this method very much easier than you can any other way.

LAVEX

Lavex, of the Lavex Chemical Company, Kansas City, Mo., appears to be a new name for what used to be called "Maignen Antiseptic Powder," put out some ten years ago by the "Maignen Institute for the Study of Bacterial Diseases" of Philadelphia. At that time, it was claimed to be a mixture of calcium hydroxid, sodium carbonate, aluminum sulphate and boric acid. The Council of Pharmacy and Chemistry reported on Maignen Antiseptic Powder in 1914. In 1915, the government declared Maignen Antiseptic Powder misbranded. (*Journal A. M. A.*, Nov. 29, 1924, p. 1787.)

THE CARE AND TREATMENT OF JUVENILE DIABETES*

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The problem of the treatment of juvenile diabetes is quite different from that of the adult. It is decidedly more difficult. The rapid, at times even fulminating, course makes it a dangerous disease at all stages and one in which—until very recent date—the prognosis was anything but hopeful.

The problem of the diet is more formidable in the child than in the adult. We have the extra load for the requirement of growth and the greater activity of the child to contend with. Marked restriction in the diet is severely resented and under-nutrition is poorly tolerated.

Anorexia is frequently an early and troublesome factor.

A combination of high fat diet with low carbohydrate diet easily leads to trouble and expresses itself in the rapid development of acidosis with early manifestations of coma.

Infections, dreaded as complications in diabetes, are far more common in children than in adults.

All the contagious diseases occur largely during the age of childhood. Throat and nose infections are also more common during this age.

On account of the small volume of blood and other tissue fluids only a relatively small amount of free glucose is available to act as buffer to insulin injections. This limits somewhat the range of insulin dosage and increases the danger from insulin shock.

The results presented here are based on a study of thirteen cases treated during the past year in the University Hospital. These comprise a series of six boys ranging in age from four to twelve years and seven girls ranging in age from fifteen months to eleven years. The average duration of the trouble at admission was four months in the boys and nine months in the girls.

The boys were kept under hospital regime and on diabetic treatment an average of seventy-one days; the girls, an average of forty-one days. The interesting fact is noted that the girls yielded more readily to treatment in spite of a longer duration of the disease before admission. The probable ex-

*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, October 9, 1924.

planation lies in the fact that girls are more tractable as regards dietetic measures and are less active than boys.

Of the symptoms first noted in these cases the earliest was polyuria. Nine out of thirteen showed this. Polydipsia occurred less frequently. Polyphagia was noted in five out of thirteen cases. Loss of weight and pronounced fatigue was the first symptom noted in four of the thirteen patients. In one case coma in connection with an attack of otitis media was present at the onset. In another, muscular twitchings and choreic movements. Acidosis always was a later symptom and in one case furunculosis. Some of the cases showed gastrointestinal distress and a few had troublesome constipation.

The psychological reactions were somewhat abnormal in most instances. Loneliness, shyness, nervousness, homesickness, and tendency to hysteria were observed in some of the cases; in others a morose disposition developed with marked irritability and crying upon the least provocation.

The family history was singularly negative, certainly as regards diabetic antecedents. In none of the cases were the parents affected with diabetes—active or past; and in only one case a brother had died from the disease. The mother of one case had nocturia but it was not determined whether she passed sugar in the urine.

Tuberculosis was present in the antecedents of another case and one mother had chronic gall-bladder infection.

Two of the boys had had no contagious disease and only occasional moderate tonsillar infections. The others had had one or several of the contagious diseases some time preceding the development of diabetes.

The girls all had had either severe infections such as broncho-pneumonia or otitis media or one or several of the contagious diseases preceding the onset of diabetes.

In a number of the cases varicella or vaccination had preceded the onset of diabetic symptoms either immediately or some six months previous. This may have been coincidence and probably has no significance. Most of the patients had fair development but were in poor nutrition and had suffered considerable weight loss. This was not strange in view of the nature of the condition and the difficulty of handling the case in the home and the ignorance

of the parents as regards the special dietetic requirements and the general care of a case of diabetes.

The school children of this series made good progress in school.

Eleven of the thirteen children were affected with chronic tonsillar infections.

Diacetic acid and acetone was present in all the cases on admission and the amount of sugar in the urine of a twenty-four hour specimen on the second day of admission shows from 1 to 160 grams of sugar.

Six of the cases received insulin during the first twenty-four hours. In these the average urinary sugar in the second twenty-four hour specimen would not exceed 20 grams.

Seven did not receive insulin in the first twenty-four hours but were on rigid dietetic measures. In those cases the average range of the urinary sugar in the second twenty-four hour specimen was around 40 grams.

The average hemoglobin and red cell count was high in all of the cases. This is doubtless a concentration phenomenon. The very severe forms had a low hemoglobin percentage and a low red cell count. Several of the patients admitted in the pre-coma stage gave a positive Wassermann test which later became negative as the case responded to diabetic treatment.

The nitrogen chemistry of the blood showed occasional high urea and creatinine values but in general was nearly normal.

The blood sugar varied from 200 to 600 milligrams in 100 c.c. of blood. (The normal is from 80 to 120 mgs. per 100 c.c. of blood.)

None of the cases had nephritis and only one showed rather pronounced edema. This cleared up on the second day after admission.

Six of the thirteen cases here reported were admitted to the hospital during the second and third quarter of the year 1923. These were given very little insulin and were placed on an initial fat free diet. With the exception of the use of the small insulin dosage this routine of treatment was equivalent to the underfeeding or starvation method of treatment. The initial diet had a total glucose to total fatty acid ratio of 1 to 0.33. The cases remained in the hospital an average of 86 days and were discharged on a diet having a ratio of 1 gm. total glucose to 1.6 gms. total fatty acid.

The seven later cases admitted since the last quarter of the year 1923 up to the present time were all given adequate insulin dosage and placed on initial diets containing carbohydrate, protein and fat. The ratio of the total glucose to the total fatty acids in the initial diet was 1 to 1.6 and in the diet on discharge was 1 to 1.8. The average duration of the hospital stay of these patients was forty-two days.

The total calories given per kilogram body weight varied from 49 to 104. The amount depends somewhat on the age of the child and its activity. A hundred calories per kilogram body weight should cover the requirement of an infant up to 18 months or two years. From that period to about the fourth year it could range between 70 and 100; from 4 to 12 years between 70 and 50 calories per kilogram body weight.

In planning the diet for the diabetic child it is essential not to overlook certain facts and needs outside of the purpose of establishing a definite sugar tolerance for the organism by the combined use of diet and insulin.

There must be adequate caloric supply to produce gain and there must be enough to cover growth requirement. It is difficult and quite unnecessary to keep the diabetic child confined or absolutely inactive. One must therefore not estimate diets and caloric requirement on the basis of basal metabolism figures alone.

Three of the cases were in a state of coma when admitted to the hospital. The other ten were in what might be called the pre-coma stage.

With very slight modifications, the treatment recommended by Wilder for cases in advanced stages of acidosis or diabetic coma was carried out in all of the cases reported.

Water was given freely. The stomach was washed out with a weak sodium bicarbonate solution and an enema was given to clear out the bowel. If fluids were not taken by mouth, a duodenal tube was passed and left in place. Water and orange juice could then be given easily. The child was put at complete rest, and kept warm with blankets and hot water bottles. Fluids can, of course, be also given by all the other usual routes—rectum, hypodermoclysis or intravenous injection.

Insulin was given in repeated small doses always buffered with carbohydrate in the form of orange juice. (About 5 units of insulin will cover

the carbohydrate of 3 ounces of orange juice.) The initial dose of insulin was either 10 or 20 units—or even less—buffered with 3 to 6 ounces of orange juice.

If the patient did not rouse or respond readily or refused fluid or food, the dose was repeated in two hours. If there was definite clinical improvement it was repeated in four hours. Urinary specimens were examined for sugar when passed.

On the second day of admission or after the stage of coma had passed, food was given. The initial diet consisted of carbohydrate, fat and protein. For the patients below ten years from 70 to 100 calories per kgm. body weight were allowed. For those over ten years the caloric need was computed on the basis of Du Bois' table. (By taking the height and weight, get the surface area in square meters. From the table of age and sex get the number of calories required per square meter of body surface. The product of the number of square meters and the number of calories needed per square meter for the age and sex gives the number of calories required.)

The diets in the hospital are all weighed and prepared by competent dieticians.

With the patient on these known diets, twenty-four hour specimens of urine are examined daily for sugar (Benedict's solution for quantitative determination of sugar). If the sugar is present in the urine in small amounts—i. e., below 10 gms.—the diet is readjusted and more fat and less carbohydrate is given.

If sugar is present in larger amounts—10 gms. or over—the insulin dosage is adjusted so as to give one unit of insulin for every 2 gms. of carbohydrate given. (A unit of insulin will generally cover less than 2 gms. of carbohydrate. This allows some leeway and guards somewhat against insulin overdosage.)

In the beginning of the course of treatment, blood sugars are taken in the morning and in the evening and at any time in the course of the treatment when there is any doubt about the true picture of the carbohydrate metabolism. Blood sugars are also always taken before the discharge of the patient.

The diet is gradually increased in calories over the initial diet to the point where the child is satisfied and comfortable and is definitely gaining in weight. This is generally accomplished by increasing the protein and fat component.

If foci of infection were present in the case, they were removed at this stage.

If the amount of insulin required exceeded 30 units per day, an attempt was made to decrease this amount, so as to lessen the expense to the family on discharge of the patient. This was sometimes accomplished by lowering the protein to 1 gm. per kilogram and increasing the fat content of the diet.

We have observed in several of the severe diabetics that they required from two to four times as much insulin if the diet was high in protein—i. e., 2 to 3 gms. protein per kgm.—and lower in fat, the number of total calories remaining the same. The amount of insulin required dropped considerably if the protein was reduced to 1 gm. per kgm. and the fat increased.

During the period of adjustment of the diet, accurate record is kept of the number of units of insulin used daily and the daily amount of glucose in the urine. The glycosuria will either go up or down. This may mean hyperglycemia or hypoglycemia but is not necessarily a true index of the level of the blood sugar. We have observed cases in which glycosuria did not occur even with the blood sugar at a level of 250 mgm. per 100 c.c. The glycosuria does, however, give a fairly good index of the amount of insulin which should be given as the daily dose.

To give an example: If the dosage of insulin for the day were 10 units and the urine for that day showed 10 gms. of glucose, but on the following day with the same dose of insulin showed only a trace and on the following day no sugar, it would indicate that the dose of insulin was larger than necessary and could even prove dangerous. We decrease the insulin dosage by about 2 units daily up to the point where the urine again shows traces of sugar in definite amounts. This will indicate that the dosage of insulin, let us say at 4 units, is now inadequate. The optimum lies somewhere between 10 and 4 units—possibly at 6 or 7 units. No change is made in the diet during the entire observation. The entire procedure is checked with a blood sugar and if the patient is on a rational diet, he is ready for discharge from the hospital.

Before discharge from the hospital, the mother or regular attendant of the patient is carefully instructed in the following things: To prepare seven different diets, each to contain equivalent amounts

in grams of carbohydrate, protein and fat. As a guide she is supplied with a text such as Wilder's "Diabetic Primer" or similar book. The mother is present daily, if possible, in the diet kitchen during the last few days or week preceding the discharge of the patient so that she may gain first-hand information about details in preparing the diet. The purchase of a Chatillon Spring Scale or Hanson Spring Scale for weighing out the foods is recommended.

The mother or attendant is instructed to watch for and recognize symptoms of acidosis or hypoglycemia and to know what emergency measures to use. She is instructed in the use of insulin by the hypodermic needle and must obtain two 2 c.c. Luer glass syringes and know how to use them aseptically.

The technique of testing the urine daily for sugar with Benedict's solution is very simple and is easily carried out in the home.

A specimen of urine with a report on the patient's general condition is sent to the hospital at least once a month for an indefinite period.

This routine of treatment and follow-up of the case has so far given us very satisfactory results.

There was only one instance of insulin shock among this series. We were quite fortunate in having few severe or acute infections as complications. These, of course, require special care and much more intensive insulin therapy.

Insulin has proved as great a boon in the treatment of diabetes of childhood as it has in the adult. It stays the rapid and formerly so fatal progress of this disease in childhood. It makes possible the use of a diet so liberal that a child will readily take it and grow and thrive on it. It is an absolutely certain remedy in the prevention of advanced acidosis and coma, which conditions formerly sealed the doom of the child.

The serious drawback to the prolonged use of the remedy is the eventual complete dependence of the diabetic organism upon it and the mounting dosage necessary to meet the metabolic requirements of an organism verging on or in a complete state of diabetes.

The greatest reliance should still be placed on a carefully planned and carried out dietetic regime supplemented with insulin therapy only in emergency or to bridge over a situation which dietetic measures alone cannot master.

• The tendency to high fat diet now rather favored in the treatment of the adult diabetic is not quite so promising for the child. Anorexia develops on it more rapidly. The child generally takes such diets poorly. The urine will become free of sugar and acetone bodies more quickly if its ratio to carbohydrate is not so high. In the presence of severe ketonuria or of infection it is surely contraindicated. The somewhat lower antiketogenic-ketogenic ratios seem to give satisfactory results and are recommended for the diet of diabetic children.

• The entire field of diabetes both in childhood and adult life has through the discovery of insulin been thrown open to renewed and intensive investigation. Our possibilities in the treatment of this disease are more clearly defined than ever before and likewise our limitations.

PEPTONE SOLUTION FOR HYPODERMATIC USE (ARMOUR) NOT ACCEPTED FOR N. N. R.

Peptone solution for hypodermatic use is marketed by Armour & Co. in ampules containing 1 c.c. of a 5 per cent solution of Armour's Special Beef Peptone. The product is advertised "as an aid in immunization, hypodermatically and orally" and the advertising refers in the main to the firm's peptone solution for hypodermatic injection, although its intravenous use is also dealt with. Emphasis is given to the use of peptone in the treatment of asthma. Reference is also made to its use in such conditions as hay-fever, skin affections associated with asthma, cyclic gastro-intestinal attacks, urticaria, coryza of the spasmodic type, migraine, angioneurotic edema and pruritus. Intravenous medication—some wise and some foolish—has greatly increased in recent years, and it is not surprising that foreign proteins should be used in the hope of accomplishing something in conditions such as those for which the Armour preparation is advertised. It is a serious question whether the best interests of medicine are served by the recognition of methods, the real value of which is not established, the limitations and dangers of which are not understood, and the general employment of which contributes to the profits of those who sell the product, rather than to a knowledge of the actual value of the product. For this reason, the Council on Pharmacy and Chemistry voted not to accept Peptone Solution for Hypodermatic Use (Armour) because it is an unstandardized mixture, and because its acceptance would be taken as an endorsement of the use of peptone for intravenous use, presumably for all the conditions in which its employment has been recorded. The Council wishes it understood that, in not accepting this preparation, it has no intention of opposing the legitimate use of protein preparations by those who wish to study non-specific protein therapy. The Council reports that Armour & Co. appeared willing to undertake the standardization of the protein, but that the rejection of the preparation was affirmed because its value has not been established. (*Journal A. M. A.*, Nov. 29, 1924, p. 1786.)

SIGNS OF THE TIMES—THEIR CAUSES AND EFFECT*

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In most countries, other than our own, the breadth of a medical man's practice and his prestige among the laity is largely governed by his standing in his own profession; and in the specialties, particularly, by his reputation for merit among his fellows. It would be especially fortunate for all the people if it were so everywhere, for his indulgence would not be long lived except for merit, soundness and honesty of purpose, under the qualified scrutiny of his own kind.

In some countries of the old world a change or even frequent change of residence from one educational center to another is not unwelcomed by a medical man so long as it is by way of promotion in his capacity as a teacher in educational institutions, for he knows, undeniably, that his practice and clientele is assured by his standing in the scientific world and will be awaiting him in full measure upon his arrival. It is not until he reaches the top in the educational world that he expects or wishes to settle down to an unchangeable residence, and this, of course, is usually in the most desired metropolis, where his fame and success financially, as well as scientifically, can bloom to its utmost. It is not at all unusual to find men of exceptional ability and renown as teachers who have kept working places in government clinics for ten, fifteen, or more years, putting in the best hours of the day for a mere pittance of salary and attending their private practices at early and late spare hours, for they know only too well that fame and fortune depend entirely upon their standing in the educational world and among their professional fellows.

In this glorious country of ours, though young and blasé, where nothing succeeds like success, cheek and bluff not only take a great handicap at the start, but seem to be able to go on and on without hindrance. But this can not long endure. Just as sure as water finds its level, so will the fittest and best survive in medicine, as life's struggle increases with density of population. The standards of medical education and requirements from graduates entering practice, constantly being ele-

*President's Address, Minnesota Academy of Ophthalmology and Oto-Laryngology, Minneapolis, Oct. 10, 1924.

vated as they are, in the form of compulsory internship, serving of fellowships in the specialties, and special preparation before recognition is accorded them, will gradually eliminate the incompetent and safeguard the community.

In the mad rush for dollars, medicine has not escaped, and for a time, at least, and especially since the war, a medical man's success seems to have been computed solely in figures of his income. Commercialism has had full sway.

The time is close at hand, I believe, when such success alone will not be accepted as success, and where only meritorious endorsement and acknowledgment by one's fellows in the profession will count in the career of a medical man.

Not long ago an article was written entitled, "Why Has the Medical Profession Lost the Position It Once Held in the Esteem of the Public?" which caused an unusual uproar at home and abroad, but which at heart was well understood by all thinking men in medicine. The fact is that its truth hurt, and it seemed easier to bear by trying to persuade ourselves that it was not true.

One of our societies, endeavoring to sustain our prestige before the world, requires of applicants for membership a pledge to abstain from dividing fees with other physicians. It could have well, and with benefit, included the clause, "nor will I be interested in the receipts of druggists, undertakers or opticians."

I know of a man who takes personal jewelry from patients as security for his fees. Is it any wonder that we are losing caste with the people when it is a well known fact that our specialty has become extensively tainted with commercialism in splitting fees with tradesmen, and tradesmen, too, whose profits are inordinately out of proportion to the average profits of men in usual lines of business? A business that can afford to pay commissions of 40 per cent of the cost price of articles sold, and still have abundant profit left for itself, can surely be included in the bonanza class. The growth and multiplication of optical houses and opticians' stalls throughout the length and breadth of the land attest conclusively to the very profitable business that it has become.

The most demoralizing and compromising sins of the human kind are secret sins, and the secret split between the oculist and the optician is no exception. Let the man who challenges this statement answer just one question: Is he willing for

his patients to know that he is receiving part of the cost price of the glasses after being paid in full for his services?

Nor is the association in any form between oculist and optician dignified or becoming to the professional man, whether it be with the optician's shop down the street or with one maintained in connection with the oculist's office. In the latter, the claim can be made that it is advantageous to the patient, but it is a very universally accepted belief that the advantage is to the oculist alone, and that advantage a financial one almost entirely. Although this commercialism is in the open and not secretly conducted, it is nevertheless quite compromising. It has the appearance of a diminutive department store, and that is the impression left upon the minds of alert and thinking people.

The oculist who is obliged to dispense his own glasses, who has not the services of a competent optician at hand, and who has to fit the glasses himself and has to pay for the glasses he orders, whether in turn he is able to collect for his services or not, surely does not come under this criticism and is entitled to what he gets.

The vast majority of opticians are incompetent when measured as to scientific preparation, many being promoted from the store errand boy, with no subsequent or additional education; and when compared with the few outstanding competent men in our midst there is emphasized the necessity for constant vigilance on the part of the oculist to safeguard his patients against their mistakes.

The chief offenders in this clandestine traffic are the wholesale opticians, and their present desperate competition is the result of their double dealing with the small retail optician whom they have led to invest extensively in paraphernalia while at the same time they have endeavored to strip him of his prescription business by playing direct with the oculist for his prescriptions on a split basis. The quality of work of these wholesale houses is of the mail-order stamp, quantity and not quality. Instead of being moulded to the patient's face, the fit of his glasses is like a loose halter on a frisky mule in the barnyard. The most careful work of a careful oculist can thus be made to count for naught. This is the type of work generally produced by the commission-paying optical house, and it is difficult to see how any man with pride in his work can risk its being entirely undone by such workmanship.

The scientific optician, on the other hand, when truly worthy of the name, as Edward Jackson points out, has a long lineage of learned and skillful workers to whom he can trace the knowledge and skill that he has mastered and employs. He has earned and deserves a dignity in which the ambitious but superficially prepared optometrist can have no part.

We need make no apology whatever in elaborating upon this compromising relation between oculist and optician. One of the important matters of discussion before the ophthalmological section of the American Medical Association during the June meeting was this very subject; deprecating the sale of glasses by oculists in communities where competent dispensing opticians are available, and resulting in a stinging resolution declaring that the acceptance of commissions or other considerations, directly or indirectly, from opticians or optical houses, from the sale of glasses, is contrary to all medical ethics, and as reprehensible as splitting fees. The committee report denounced the acceptance of commissions in strong language, declaring it to be pernicious and reprehensible and underhanded. The same resolution was adopted by the American Ophthalmological Society. A committee, of which Derby was chairman, stated that there is at least 100 per cent net profit in the glass business. No wonder the street-car advertising campaign is extensively carried on in the hope of getting all the populace to put on glasses.

In reality, false pretense can be openly charged in sending patients to the wholesale house, for frequently they are led to believe that they are going there for the benefit of the wholesale price, when in reality the oculist, acting as a paid decoy, is getting the margin above the wholesale price, and the patient pays practically the usual retail price charged anywhere and everywhere. How can a self-respecting professional man look into the face of his patient and do such a thing?

The Derby report states that such men are dishonest and should be barred from all honorary societies.

A physician's investments are his private affair, and in general he would not welcome promiscuous scrutiny of his holdings. It is annoying, but nevertheless it is true, that representatives of optical houses, in their campaign for business, carry lists of oculists who are stockholders in the various optical concerns and display them, too, to prove

what influences these men to send their work to other competitive houses.

Such association is not conducive to dictation and control by the oculists, and very often poor people, timid by nature, are given most extravagant and expensive mountings where they can ill afford to pay for such.

The average oculist is unfamiliar with the problems of the optician, but should thoroughly familiarize himself with them so as to be in a position to criticize his work.

It is not generally known how active and influential this optical industry is. Health talks by accepted men are being thrown out of the papers as the result of criticism of the opticians. I believe Dr. Brady, at a meeting somewhere in the East, said that his article on cycloplegia had resulted in his health service being excluded from some papers.

The profession had better settle down to supporting strictly dispensing opticians. The better class of people are rapidly choosing such for themselves as the superior type.

The inclination and impetus given to group medicine has been largely the outcome of specialism co-operation in the base hospitals of the army, and to many of us returning to private practice it seemed almost indispensable after enjoying its advantages during our stay in the service. There, where we were all common workers for Uncle Sam, striving to do the best for the good of our comrade patients, divorced from the temptations of Mammon and covetousness, and with only the wholesome competitive spirit of outshining the other fellow in the eyes of our associates, its operation was ideal and complete. In private practice, however, many of its advantages are shorn from it. In many instances, selfishness, greed and commercialism, both in the groups and outside in opposition to the groups, have done much to nullify its ideal operation. Old associations have been cleaved as a matter of business policy. Former consultants of choice are no longer available in the lineup of interests, and the cordial fraternalism of former days is chilled to the tragic detriment of the local profession in many communities.

In practicing the specialties, the all-dependent, intimate and devoted relationship between physician and patient that the family doctor enjoyed in years past is tremendously upset and comparatively unknown except to those of us who have practiced as general and family physicians; and the thought

has often come to me, Do we practice surgery among these comparative strangers, one might even say transients, according to the good old golden rule that we used to apply in recommending surgery to our families in general practice?

Especially is this question applicable in considering our nose and throat work. Shambaugh, of Chicago, whom we all respect, has written that in his opinion 60 per cent of septum operations performed are unnecessary, and that much of the nasal sinus work done would better be left undone.

Then, too, in tonsil work in children, in this day and age when children are brought to us really for no other reason than that "the child next door has had his tonsils out," do we consider carefully enough before summarily scheduling them for surgery the next day? Tonsillectomy in adults is generally rationally indicated before it is done, because the adult knows that there is something the matter with him that may justify it. But in children, coming before us largely because of the present popular tendency, the indication should be unmistakable rather than routinely agreed upon. If the little people before us were our own children, would we demand tonsillectomy? If the answer is yes, then let us go ahead, but not otherwise.

The mastoid operation, too, in the early stages of middle-ear inflammation, may look immediately necessary when experience shows us that fully a majority of such cases, with even many of the cardinal symptoms, recede and fully resolve in the regular course of the malady. Occasionally, we get into trouble by waiting, but not often, and the alert, well-grounded and capable man need not be rushed into needless surgery.

Men in special work from the time of their graduation seldom have the large and general perspective in diagnosis, and are slow to accept or even think of the condition before them as being attributable to anything outside of their specialty. It is a misfortune that all men in our line have not the advantages and benefits of several years of general medicine and surgery; and especially is it a misfortune for the patient if his specialist attendant is not the one inclined to call to his aid the internist, the surgical pathologist, and the laboratory expert. De Schweinitz, in a paper of a year or two ago, covered this aspect of the matter very admirably under the title of "Specialism and Co-operation."

The eye, ear, nose and throat man with many

years' experience in the general field of medicine makes observation of the patient before him that often carries the patient immediately out of his charge and results in prompt reference to men in other fields. And I know of no more favorable impression that can be made upon a patient, or anything that is appreciated more, than for a man of our specialty to recognize and divert the case to the proper department in medicine. Usually, such patients are the ones that follow him for years for advice in selecting consultants in all branches of our profession.

A matter that is largely under discussion by all medical bodies at this time is the advisability of systematic radio talks. This matter must be approached very carefully and speakers selected with the greatest care, for the feeling of affection once felt for the old family doctor no longer obtains, and the trend of commercialism in medicine may lead to the suspicion of exploitation of themselves by such means. All such discourse, however, must be strictly constructive and not argumentative, for such disposition leads to embitterment. All such speakers should be chosen and instructed by our societies.

Our popularity with the masses must come from our largeness and magnanimity of character, from patience and tolerance, charity and sympathy, and freedom from greed and selfishness. In the practice of medicine, as in no other profession except the clergy only, must we be our client's friend as well as his physician.

The idea of trying to eliminate abuse of free service by organization action is wrong and appears to the public as if we are solely striving to insure our selfish financial ends. Individual action is preferable in declining to give free service where patients are not entitled to it.

We must avoid appearances of trying to monopolize state institution aid except as our merit will bring of itself this monopoly.

So far as getting legislative co-operation is concerned, I think our experience in connection with the attempted basic medical practice legislation has determined us never again to submit ourselves to such abuse and indignity. Any sympathetic and friendly consideration that we may get from the legislature will not come as the result of antagonism and opposition toward others, but rather as the result of initiative in new and universally beneficial legislation sought for.

Our medical schools should exercise greater care in accepting applicants for medical education; and we, in extending membership in our societies. We must make every man feel that unless he earns the regard of his fellows for merit, soundness and honesty of purpose, he must remain outside the fold; that financial success without the foregoing will prove only an empty, hollow accomplishment, abhorrent in the eyes of all. If we hold to these standards strenuously, the laity will soon follow our lead in accepting medical attendance as they do in the old countries.

The present general outlook and sign of the times as applied to medicine—and in these days it means the specialties—is stormy and troubled. We are beset on all sides and in our midst by grave dangers, mostly of our own making and our own fault. We have followed false gods and must retrace our steps. The detour has proved unsafe, and we must get back to the old road. If we do not, state medicine will be the mire in which we shall find ourselves stalled and helpless. We must benefit by the experience of our elders, in this instance the countries of the old world, for their position in many ways will be our position in time to come. Standards of judgment must be safe standards, tried and sure, and the laity will eventually learn to accept the qualified guidance and direction of the profession in selecting their medical attendants. When they do, survival of the fittest will prevail, and only those of merit, soundness and honesty of purpose will be considered or receive recognition by their fellows.

WHY TUCKER'S ASTHMA SPECIFIC?

For some years there has been put out from Mount Gilead, Ohio, a nostrum known as "Tucker's Asthma Specific." The nostrum, which is sold on the mail order plan, declares on the label the presence of 5 grains of cocain to the fluidounce. It has been analyzed at various times and substantial amounts of cocain have been found. A case of cocain poisoning from the preparation has been reported. The nostrum has been declared unsalable in the State of Massachusetts because of its cocain content. In 1910, the U. S. Department of Agriculture issued a bulletin of "Habit-Forming Agents" in which a warning against the Tucker preparation was included. To learn how the Tucker concern can send out a cocain-containing mixture without violating the Harrison Narcotic Law, an inquiry was sent to Washington. The Commissioner of Internal Revenue replied that, while Tucker's Asthma Specific carried a label admitting the presence of cocain, the facts were that before

For this reason, it behooves all men, and especially the young men in our specialty, to seek participation in the service of our public and charity hospitals and dispensaries. In such service, more than in any other way, is merit and ability observed by one's fellow practitioners. On the other hand, in no surer way can a man hide his ability, no matter how exceptional, than by keeping tightly to himself in his own private practice. Surely, one's career is not complete, nor should it be at all satisfying to the most modest and retiring, without having had a service of many years in our public and charity hospitals and dispensaries. The most enduring and ever helpful friends I have are the ones I have toiled with in such service.

Affiliation in teaching capacity in our medical schools, too, should be indefatigably sought by all young men of our specialty. Nothing can so warm one up to study and effort as brushing up in preparation for instruction of students assigned to his class. Getting a new and different assignment of subjects each year is the greatest rejuvenation I know of, and can keep one awake after the evening meal better than anything else. Good instructors and earnest workers are always in demand and are always welcomed.

Constant attendance and participation in our society meetings will be the rule, and we will learn to work and strive for the regard and respect and admiration of our fellows, which will set the final grand standard, as in countries of the old world, of safety and endurance, and get us back on the old road of public esteem.

the remedy reached the public, the cocain became hydrolyzed and there was either no cocain or but an infinitesimal quantity. The Commissioner also declared that the mail-order distribution served "a great humanitarian cause" and, therefore, it had been decided by the Treasury Department to take no action enjoining its distribution. Further correspondence brought the statement that samples of the Tucker Remedy taken on the market, when analyzed, showed either no cocain as such, or not to exceed one-half grain to the fluidounce. Even if one admits the "humanitarian" motives of the exploiters of this "quack medicine" and the various other claims made by the Treasury Department, the fact still remains that the sale of the Tucker remedy seems to be an obvious violation of at least one federal law. If it contains no cocain, then it is misbranded. If it contains cocain or a derivative of cocain, then its sale violates the Harrison Narcotic Law. (*Journal A. M. A., Nov. 1, 1924, p. 1435.*)

THE MEDICAL ASPECTS OF BEHAVIOR PROBLEMS IN CHILDREN

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Committee for Mental Hygiene

Minneapolis

Problems in human behavior may be approached from many environmental and personal angles, and workers in many different fields have a great interest in the topic. Thus, there are problems in education, in morals and religion, in general social relationships, in law, in psychology and in medicine, and workers in each of these fields have varying methods of approach to the problems involved. In the medical field the psychiatrists have rather led in the attack upon behavior problems in general, since after all they come into contact with patients because of some alteration in behavior which leads to a suspicion of mental unsoundness. So far as the behavior of children is concerned, the pediatricians have had a superior opportunity which they have met in varying ways and with varying degrees of success. It seems to us that the pediatricians in the Twin Cities are very alert to this problem and have a great interest in the evolution of methods.

The interest of the psychiatrist in problems of child behavior is not a new thing, since they have been doing a great deal of work in the field for many years, but organized attack upon these problems from the psychiatric standpoint is a relatively new development. This attack, as exemplified in a clinic such as ours, is a matter of the co-ordination of several types of expert study of the problems involved, and the organization includes psychiatrists, psychologists and social workers. Through special arrangements with hospitals and physicians, provision is made for several types of specialized medical study which are necessary in various cases. It is necessary also to establish very close relations with the various social service organizations, the courts, the school system, religious organizations, and the various types of recreational activity available. This permits a study of all aspects of the child's life in relationship to the behavior shown, and a manipulation of all the stresses found to bear a part in the production of the behavior so far as we have methods for the manipulation of such stresses. This all around attack is, in our experi-

ence, superior to any approach from any single point of view, no matter what this may be. In it we follow a central idea, by no means novel, that behavior of any sort, whether socially acceptable or unacceptable, whether making for success or non-success, is an expression of a series of adjustments between the reactive capacities of the individual, whether these be inherited or acquired, and the varying situations to which reaction must be made. It follows that we can have no idea that all behavior disorders are dependent upon a single cause of any sort. Indeed, all experience points to the very opposite,—i. e., that a behavior disorder has multiple causes, some internal and some external. Furthermore, this matter may be epitomized as follows: a behavior disorder is always in some way an expression of a discrepancy between the individual's power of reaction and the demands of the situations to which he must react. Such an attitude seems to offer the only scientific approach to the problem.

The medical aspects of the problem lie in the inabilities of the individual to react, and such disabilities may occur in either the physical or mental fields, to use a distinction which is hardly valid. Many of the mental disabilities lie in a borderline field such that they are claimed for psychology and for psychiatry. It seems to us useless to argue about the proper placing of these points, and far better to deal with them jointly, as may be done with great profit.

Bearing these points in mind, it has seemed worth while to present some analysis from our experience of the past year with cases drawn from the Twin Cities in the course of our demonstration. This demonstration situation has been unique and extraordinarily complicated and has been followed by the establishment of three clinics: one for Minneapolis under the direction of Dr. Smiley Blanton, located at Lymanhurst Hospital school; one for St. Paul under the direction of Dr. M. L. Stiffler, located at the Amherst H. Wilder Dispensary; and one at the University for the State at large, under the direction of Dr. George S. Stevenson.

ANALYSIS OF CASES

The clinic was engaged in active case work for ten months, during which time it accepted 610 cases for study, of which 77 were withdrawn for one reason or another, leaving 533 cases worked on. Of these, 359 were Minneapolis cases, 146 St.

Paul and 28 out-of-town. From this number of cases, various samples have been drawn out to show something of the variegated nature of the case material. It seems best to discuss these in orderly fashion in relation to the type of medical problem presented. Solely for convenience, the medical problems have been divided into the general medical and the psychiatric groups. This is at best a highly artificial type of distinction, since there is so frequently a subtle interweaving of physical and mental problems.

1. *General Medical Problems.*—The routine study of a case includes a complete physical examination and urine analysis, with Wassermann tests done on all cases where it is thought desirable. It was impossible, and perhaps unnecessary, to have the Wassermann done as a part of the routine examination. Any special conditions found or suspected were then referred to the proper department of the University dispensary, to certain physicians who made special studies for us, to hospitals, or back to the family or referring physician. For the most part treatment of conditions found was then carried out by the physician to whom the case was referred. In order to ascertain something of the relative frequency of various conditions, we have analyzed the refers and treatment recommendations in an unselected series of 200 cases, and the results follow:

In 19 cases no medical recommendations of any kind were made. That is to say, in 9.5 per cent of these cases, no conditions demanding further medical study or treatment were to be found. Of course, in some other cases studied from some special viewpoint, the results were negative and no actual treatment was finally found to be indicated.

The special studies requested were as follows: Wassermann, 54; spinal fluid, 8; blood count, 7; sugar tolerance, 6; roentgenograms, 20 (in 16 of ductless glands which can be so studied); complete endocrine study (kindly done for us by Dr. Henry Ulrich), 18; basal metabolism alone, 14; medical consultation for definite endocrine disorder, 6; hospitalization, 9; refraction and other examinations of the eye, 28; fatigue study, 2; heart study, 6; dermatological, 4; neurological, 1; general study, 3; nose and throat, 34; ear, 9; hernia, 3; genito-urinary, 10; gynecological, 5; orthopedic, 4.

In this same group, our records show the following treatment measures carried out: general hy-

gienic measures (rest, sleep, exercise, dietary regulation), 68; removal of tonsils and adenoids, 34; enuresis regimen, 9; epileptic regimen or luminal, 6; for chorea, 2; antiluetic, 2; for anemia, 3; hydrotherapy, 2; endocrine therapy, 25.

It will be seen from this tabulation that a large number of medical disorders came into view in connection with this group of cases. Probably a complete survey of all the cases would show a still larger variety and would change the relative distributions but this will serve to give some idea of the number and importance of the conditions found. This survey is enough to emphasize the oft repeated point that biological soundness is extremely important from the standpoint of the behavior of the organism. Biological unsoundness may produce direct effects in behavior, but more commonly the behavior is a result of the reaction of the individual to the limitations in activity produced by the limiting process. This is an excellent example of the effect of a discrepancy between the individual's capacity to react and the situations to which he must react, and here the limitation of capacity is the direct result of organic processes of one sort or other.

Some of these matters are worthy of further elaboration. For the most part, the conditions tabulated produce their effects in the limitation of activity in some secondary way. Perhaps this point is most clearly shown in the cases in which the behavior is primarily the result of *fatigue*, and the fatigue in turn is due to a combination of causes including often several physical causes.

We have long known that fatigue produces various changes in mental attitudes and reactions, the commonest being an increased irritability. In children this increased irritability is often expressed in overactivity of various kinds, including ordinary types of restlessness, inability to concentrate, a constant darting from one thing to another, quarrelling, disobedience in various forms, stubbornness, insomnia, lack of appetite, and a form of activity which often leads the parent to feel that fatigue could not possibly produce the situation. Dr. Max Seham has made a careful and exhaustive study of the fatigue problem, and very kindly reviewed for us a series of 16 cases in which we thought this problem especially important. For these he prescribed the indicated forms of medical treatment, as well as the special measures which lead to a decrease in the fatigue manifestations.

In a considerable additional series of cases we made use of the schedule provided by Dr. Seham as a means of combating and preventing fatigue.

Many conditions can contribute to the production of excessive fatigue. Tonsils and adenoids, infections, acute and chronic, and various types of endocrine disorder come at once to mind. In addition there are many more subtle questions of fundamental constitution, of which the asthenic type (of uncertain origin) is the outstanding example; of malnutrition and of the emotional pressures engendered in various ways in the home. Sometimes all or several of these are combined in a peculiarly vicious set-up which is most difficult to combat. Needless to say, for lasting results every element in the situation must be reached. To do so involves, first of all, the correction of such physical disorders as are present and treatable. Then comes the erection of a schedule of activities which will be carried out, including diet, rest and exercise. The most difficult and time consuming job is the correction of attitudes within the home and the erection of a rational scheme for meeting the problems presented. Often, as in other types of case, this involves psychiatric or medical treatment of some important member or members of the family, as well as the direct treatment of the child. In this phase of the work, time and patience are the great desiderata. The resulting changes in behavior when the fatigue problem is adequately met are little short of marvelous and are extremely satisfying both to parent and physician. In some of our simpler cases we have had excellent results from nothing more than the introduction of a rest period in the middle of the afternoon. With this increased amount of rest there comes, often to the parent's great surprise, an increase in the amount of sleep at night, an increase in appetite and gain in weight from the additional food consumed and lessened energy demands, a lessening of the restlessness, irritability and an increased power for sustained attention. The more complicated cases are necessarily more difficult, but if the problem is thoroughly understood, and an adequate schedule carried out with good co-operation, the results are again excellent.

While not exactly germane to the subject, it should be pointed out that *overstimulation* of children, with resulting overfatigue and extravagant behavior related to this, is a thing very difficult to avoid in our modern type of life. When to this is

added the aspirations of an overambitious parent or the competition of a group of children with which the child can under no circumstances compete, a situation is created which is pernicious in the extreme.

Sometimes in relation to fatigue, but more commonly because of the direct effects upon the capacity of the individual to react, the *endocrine disorders* loom up as a tremendously impressive problem. There are so many ways in which the ductless glands are of importance in the biological processes of the individual, and so little is definitely known about these, that we have adopted a very conservative attitude. This means that in all cases suspected of endocrine disorder we try to get a thorough study according to modern methods, with treatment as indicated by such study. Dr. Henry Ulrich has carried on this work for us, and has seen a total of twenty cases. There were other cases in which the diagnosis was obvious, or which were already under treatment, not seen by him. At this time there is nothing we can report regarding the effects of such treatment, aside from that already known. In the last analysis, what will happen to the behavior of the individual so affected depends in large part upon how adequately we can meet the medical problem involved. There is, however, also an environmental element always present which needs to be met in one way or another. This may only involve adequate explanation to parents of the situation, and securing their co-operation, or it may be much more intricate.

One of the most interesting endocrine cases seen was that of a boy of fourteen whose facies and bony development suggested acromegaly. Roentgenograms revealed an enlargement of the pituitary and findings in the long bones which the roentgenologist reported as typical for acromegaly. So far as we can find, the occurrence of typical acromegalic changes before the ossification of the bones is complete is extremely rare. Apparently the changes which occur in gigantism are of different type.

Two cases of *pubertas precox* were encountered. One was in a girl not quite ten years of age, whose general physical development as measured by height and weight and general measurements was about that of a thirteen year old. Her mental age was fourteen years one month, and pubertal changes were well advanced. Her interests are all directed to the bearing of children and the estab-

lishment of a family of her own. Presumably such accelerations in the orderly processes of growth and development are of endocrine nature. In this case there was no evidence permitting a diagnosis of endocrine disorder, and the case is only mentioned for the sake of completeness.

The other case is that of a girl of nine and one-third years, referred to the clinic because of sex interests, talk and experiences, lying and running away. She showed very definite signs of puberty, which had been in evidence for nearly two years. She showed a fat distribution typical of the hypopituitary type and a marked hydrocephalus. The mental age of seven years ten months indicated retarded intelligence development. She was referred to the General Hospital, where a most careful study was made to determine the origin of the difficulty. By this it was possible to rule out the ovaries and pituitary as causative factors; the adrenal and pineal were also excluded, but with somewhat less certainty. The disorder in this case is, therefore, a complex one, and presumably several glands are involved. Syphilis was also ruled out. In the absence of any definite indications, it was not thought wise to try gland therapy. In view of all the factors, including those in the home, it seemed best to recommend institutional care and training as representing the best available means of reaching the girl's problem.

There is evidence to the effect that the asthenic constitution is related to a failure of involution of the thymus gland, but this point is in dispute. We had special examinations made for thymus enlargement in four cases of this type, but in all no positive evidence could be secured.

With the basic problems of endocrine function no better understood than they are at present, it seems impossible to answer many questions which confront us daily concerning the relationships between the functioning of these glands and the behavior of the individual. This accordingly becomes an extremely important research field.

The problem of *congenital syphilis* is not an important one in our group of cases. Wassermann tests done on 108 cases showed 105 negative, one negative and then positive and one positive and then negative. Two other children from one family were known to have congenital syphilis, so that at the most (provided all cases were tested in which a test was indicated) less than 1 per cent of this group were affected. This experience is decidedly

different from that of a general psychiatric practice, but is in line with the changes observed by pediatricians in the character of their practice.

The other medical problems did not engage our special attention as groups. As it happens, their effects on behavior and the results of treatment are well known, though sometimes exaggerated, and it seems unnecessary to go further into detail.

2. *Psychiatric Problems.*—All types of psychiatric problems were encountered, ranging from the fully developed psychosis or psychoneurosis to types of alteration from the norm which are very difficult to diagnose. For the most part we have not given psychiatric diagnoses of the ordinary sort, preferring to consider the mental abilities and disabilities of the individual in their elements and deal with each as we could rather than consider the massed product of these more elemental situations. It seems desirable, however, to discuss some of these problems in relation to the usual groupings.

The number of actually *psychotic* seen was small. This is related to the low incidence of psychoses in children and to the fact that when a psychosis is developed the alterations in behavior are usually such that the need for treatment is obvious and the patient at once becomes a medical problem. This is not true with the run of our cases. In many cases there was an alteration of personality such that a pre-psychotic stage seemed evident, but these are included with the psychopathic personalities.

The number of *feeble-minded* was also small, representing only 13.8 per cent of the cases. An additional 14.9 per cent were borderline in intelligence, so that not quite 29 per cent belong in the group of inferior intelligence. This number may not seem small, but in view of the sometimes expressed view that all problems in delinquency are related to feeble-mindedness, the smallness is emphasized. As it happens, surveys of the intelligence of the inmates of penal institutions have given practically the same curve of distribution of intelligence as was obtained in the army draft. It must be remembered that our cases were not drawn solely or even largely from the delinquents; indeed, only 7 per cent of our cases were referred directly from the courts, though nearly 15 per cent had a court record. On the other end of the scale, that is in the group with *superior intelligence*, we find 16 per cent of our cases, leaving 55 per cent in the *average* group.

In connection with the foregoing groups comes up the question of *heredity*. The statement has been made that delinquency is a matter of the inheritance of character, and that our problem children would belong to a group of very poor heredity. We have analyzed for 200 unselected cases the occurrence of mental disease, feeble-mindedness, epilepsy, neuroses, psychopathy and delinquency in other members of the family. In this analysis the occurrence of these conditions was noted for each family. Accordingly, if each family showed each of these things, we would have a total of 1,200 entries, whereas we find a total of 307 entries as follows:

Mental disease	38	19 %
Feeble-mindedness	17	8.5%
Epilepsy	34	17 %
Neuroses	48	24 %
Psychopathy	66	33 %
Delinquency	104	52 %

These figures are open to some question, since it is always difficult to get reliable facts from which to draw conclusions. This is especially true in case a history has to be taken from a feeble-minded member of a family, but we usually know at least that that one individual is defective. However, no absolute accuracy is claimed for these figures; they are simply indicators that behavior problems occur in families of good heredity and bad heredity, just as they occur in families where there is much delinquency or no delinquency, good religious standards or poor religious standards, and good economic status or poor economic status.

No one of these factors is in itself sufficiently outstanding to justify any sweeping conclusion, nor would the number of cases justify it. They seem to show a tendency for the greater occurrence of disturbing behavior in families where there is evidence, in the personality makeup or behavior, of a mental instability in the stock, than in families where this is not true. It is very difficult, however, to relate these figures to the whole mass of the population.

The *neuroses* of children seem to be increasingly important. It is not at once evident why this is true. Perhaps it is only a matter of their greater recognition, but the fact remains that the pediatricians are finding it a more and more important problem. Our experience bears this out. Neurotic manifestations of various sorts may be found

in children of all ages. The behavior related to these neurotic mechanisms may be of the same sort as behavior related to other causes. The treatment does not differ a great deal from the neuroses of adults. Indeed the problem of the neurotic child is frequently the problem of the neurotic parent, and the first task is, by treatment of the adult neurotic, to free the child from the pressure exerted by this parent. All sorts of neurotic fears are set up in children under such conditions: the fear of disease, the constant evolution of symptoms of physical disorder, fears of the dark and imaginary forces, aches and pains, and so on through a ghastly list, all become real things handicapping the child in various ways. Thus, an absolutely healthy boy, so far as the most careful of examinations made by several good men could determine, was a typical hypochondriac, afraid to venture forth in cold or stormy weather, extremely solicitous of his diet, with constant aches and pains, etc. Here the mother was responsible for the development and continuation of his fears. Among other things, she took his temperature daily, and the slightest rise was sufficient to cause her to keep him in bed and send for the doctor. Another five-year-old boy was constantly threatened with the "bogey-man" who would carry him off and throw him in a great pit. He was terrified by this threat, and constant repetition, instead of making him contemptuous of it, only increased his terror. Every time he went to sleep, whether during the day or at night, he would have a nightmare in which he shrieked and clutched wildly at his crib. The content of his dream, which was gotten without difficulty, is quite significant. He always dreamed that the bogey-man had him and was throwing him down the pit. It was during the fall that he screamed and tried to save himself. This obsessive fear was, therefore, always with him, and interfered in all his adjustments to life.

In another case a girl of twelve had been carried for several years in sight-saving classes because of a "blindness." Refraction at various times gave varying results. The analysis here, reduced to very sketchy terms, was that the girl had a great sense of identification with her father who was killed in the war. This was greatly contributed to by the mother, who constantly emphasized to the girl her great resemblance to the father. The father had had episodic headaches for years, following an accidental injury to the occiput. A

slight injury in the same place had occurred to the girl. Further, her father had a visual error. In addition to all this emotional load, the girl had not had an easy time in receiving the attention at school she had at home. In the sight-saving class, she was of assistance to other pupils, and so was not overcome by any sense of inferiority. Significantly enough, she had a continuous headache from Monday morning to Saturday morning. By treatment of the girl, arrangement with the school, and change of the mother's attitude, this girl was gotten into regular class, where she has ever since continued with A grades in reading, the subject most difficult for those with poor vision.

Sleep walking, night terrors, extravagant behavior of various sorts, enuresis, fainting spells, temper tantrums, fears, seclusiveness, and other reactions may have a neurotic basis.

There are also many other mechanisms which belong to this group, though the type of behavior produced is not particularly of the sort commonly related to the neurotic mechanisms. Perhaps the most important of these is the inferiority complex. A certain sense of inferiority is a fine stabilizer of personality, but it can develop to a point where it becomes a very real handicap. This mechanism is particularly important in relation to fixed handicaps of one kind or other which interfere with the competitive equality or superiority of the child. Thus the child of inferior intelligence who has to compete in school with children of normal intelligence, and finds himself unable to do so, is quite apt to show behavior difficulties directly related to this. He is apt to become over-active, pugnacious, truant, and by fighting, lying, truancy and stealing attempt to set himself up as superior to the group, at least as a "hard guy." It has been our experience time and again that such a boy, when put into an educational group with which he can compete, and on subjects (such as manual training) which he is competent to do, ceases to be a behavior problem and becomes a quiet, fairly stable and interested individual. Similarly, the Jewish boy who is constantly taunted by his Gentile neighbors is apt to react extravagantly to this attempt to force an inferiority on him. In several such instances, the Jewish boy found he could buy his way to favor, and, the money not forthcoming in any other way, resorted to stealing. The money thus procured was always spent on other boys.

An outstanding case of the compensation by dis-

turbing behavior to the feeling of inferiority, this time based on an actual inferiority, was that of a boy who is permanently crippled by infantile paralysis. It was noted as a significant point that all of the gains from his stealing were spent upon other boys, usually upon some one boy who was then his friend. His own statement was: "You see I couldn't run and play with the other boys and I found they didn't much care to have me around. But if I had money, it seemed I could always have companionship." He was fully cognizant of the wrongness of his acts, and felt that "I must have been a weak fool to do it," yet no constructive plan to permit him to have the companionship he required had ever been evolved, and he himself had neither the knowledge nor the experience to evolve a better plan than the one he chose.

States of overactivity bordering on hypomania and commonly diagnosed as hyperkinetic type of psychopathic personality not infrequently turn out to be based on the inferiority complex. The mechanism works in somewhat this way: the compensation in behavior is, as usual, an overcompensation, which fails of its effect. Not only that, but great opposition is aroused by the behavior. This behavior is of the type which is usually increased by active opposition, since there is an emotional tone of resentment connected with the complex and the behavior drive. In time, therefore, the overcompensation (or, more simply, the compensation) becomes extreme and we have this hyperkinetic state.

Apparently this matter of the feeling of inferiority and the necessity for establishing one's self as an independent individual has many subtle connotations in ordinary family life. That this is directly related to the development of the Oedipus complex, which in a certain degree of strength is absolutely necessary to the establishment of a healthy existence independent of the parental influence, is unquestionably true. The difference in behavior seen in children of different ages and emotional settings in the family cannot be accounted for by such an easy formula as inheritance. Children of the same sex and nearly the same age in different families show a tendency to react similarly and this reaction in the younger children is as nearly as possible the opposite of the behavior of the elder children who in turn show very similar behavior from family to family. This tendency is so strong that we can ordinarily tell, from the behavior of the child, what his position in the family

is. There are here many points worthy of further study and analysis, which must be reserved.

The only child is particularly apt to be quite neurotic in trend. Here there is overstimulation from the adults, a great emotional load from the adults sustained by only this one individual, a lack of socialization in the group with which he must compete, leading to the development of difficult personality traits and oddities of behavior in practically all such cases.

Of the many other situations which contribute very markedly to the development of the neurotic trend, there are only two which need further mention. One is the broken home as a setting for the development of the child. Wherever one parent is continuously absent from the home, either by death or divorce, the child is again apt to be overcome by an emotional burden. The situation is even more serious when the parents still live together, but one parent consciously or unconsciously rejects the other, and throws the full emotional load upon the child. This happens far more frequently than is generally realized. Where one parent expends a full load of hatred upon the child, a difficult situation is also set up. We have several records of this sort. In one case, a very intelligent, forceful man is carrying through life a father hatred which affects only his relations with his son, to whom he has transferred much of this original father hatred. This is not some abstruse attempt to analyze his activities, but is a straightforward deduction from the man's own account of his relations with his father and with his son. In another instance, a very psychopathic man, with great interest in religious activities and boys' work, has had a tremendous struggle in adjusting himself to the marriage relationship. He is almost insanely jealous and suspicious. He hates his daughter and is unwilling or unable to deal with her in any way other than by force. She is, quite naturally, rebellious about this, and has come to be what is called incorrigible. A serious neurotic conflict in the mother, and the attitude of other members of the father's and mother's family, all contribute to the production of the situation.

The other situation contributing to the neurotic trends is the child's first great adventure in life, that of going to school. Here he comes face to face with a whole new series of situations to which he must adjust; work at fixed periods, rules and regulations, and the competition of a large group

of his fellows. A considerable amount of work done upon this topic is undergoing analysis for later publication.

The question of *psychopathic personality* in children is one concerning which I hesitate to speak. The general idea of the psychopathic personalities is that they are constitutional or inborn trends in mental makeup. This is clearly brought out in the older name "constitutional psychopathic inferiority." Concerning this idea we have grave doubts. The more closely we have studied our cases which seemed to belong to this group, and the further we have pushed into the background of the origin of the behavior traits and trends which led to the diagnosis, the fewer times we make this diagnosis and the less we consider it a matter of a fixed reaction type. We certainly view very differently the problems of the adult of fixed psychopathic reaction type and the child whose reactions are of the same general type, but are not yet fixed. For the present, our view is somewhat as follows: there is no clear way of distinguishing between reactions which are fixed parts of the biological makeup of the organism and reactions which are acquired in the stresses and strains of life adjustment. While this is unsatisfactory as a formula, it is the best we can do in view of our experience. In fact this is the experience of all workers in the field, as Glueck in particular has pointed out.

There is one condition of definite disease which is worthy of separate classification and study. This is epidemic encephalitis. Reports coming to us from all over the country, and our experience this past year, all indicate that this is an increasingly important problem. So far as the behavior of these cases is concerned, it resembles very closely the behavior of the psychopaths. In our cases there is no evidence of an intellectual dementia, though sometimes there is apparently some retardation in the further intellectual development. There do come a series of alterations in the power to concentrate, in emotional reactions, especially irritability, in impulsiveness, inhibitions and in ability for sustained effort. With this there may or may not be a Parkinsonian syndrome, though this is usually to some degree in evidence. The behavior becomes impulsive in the extreme; is characterized by outbursts of uncontrolled temper, with manifestations of brutality, lack of appreciation of the feelings of others, loss of inhibition of sex impulses and of the acquisitive instinct, and an almost auto-

matic and quite uncontrolled response to any emotion-provoking situation. What to do with these cases is very much of a question. The change in character with the resulting alterations in behavior is so definitely the result of organic lesions in the brain that we feel the correctional institutions are not the places for such children. At the same time they are quite unsafe social risks, particularly because of the sex activity. They are not proper subjects for the training schools for feeble-minded children, since they are not feeble-minded. There is good experimental evidence in favor of a re-education program, but there has been no opportunity to carry this out. For the more marked cases, we have felt that commitment to the institution for mental diseases offered the best treatment available at the present time.

GENERAL DISCUSSION

This review of the case work of the clinic has necessarily been quite sketchy and so inadequate. It will serve, perhaps, to give some idea of the types of cases encountered and something of our present views of the problems presented. It would be extremely profitable to discuss the findings and methods of treatment applied to the different types of behavior for which the patients were referred. That is felt, however, to be too long a task for this particular paper. There are, however, certain questions often asked by professional groups, which may profitably be taken up.

The chief one is, where do you get your cases? Cases are referred from many different sources. In the Twin Cities, our cases have come to us as follows: 31 per cent from social agencies; 19 per cent from the school system; 7 per cent from

physicians and hospitals; 7 per cent from juvenile courts; 10 per cent from miscellaneous sources, and 25 per cent from the families direct. Cases came from a total of twenty-seven social agencies. Less than a dozen physicians referred all the cases coming from the medical group. These two points make a curious contrast, which is somewhat difficult to explain. That so large a group of cases come direct from the families indicates the large number of parents who realize the need for such service and grasp at the opportunity afforded by the clinic. It seems to us, indeed, that the topic is very generally in the air and there are many people and groups of people who are ready to advance advice and answers to the many questions raised. The problems have so many medical aspects that it seems necessary to point out that medical interest must rise to meet the opportunity presented, else the profession will some day be regretting an opportunity overlooked. That pediatricians are alert to this is shown in many ways; that they lack training from the standpoint of the mental factors involved they readily admit, and they are trying to make some provision to meet it. An experiment we are watching with much interest is the entrance into the clinic for experience of a man with an excellent training in pediatrics.

This paper may be summed up by stating that in it are given facts and opinions regarding the medical aspects of behavior problems, drawn directly from a year's experience with a behavior clinic serving the Twin Cities. I am indebted to several members of the staff for aid with the tabular matter, and to many unquoted sources which have aided in the evolution of the ideas presented.

THE PHOTO-ACTIVITY OF SUBSTANCES CURATIVE OF RICKETS

In addition to conspicuous changes in the composition of bones in rickets, disproportions occur in the concentration of calcium and phosphorus in the blood plasma. The chemical make-up of the latter is soon restored to a more normal character whenever effective antirachitic measures are instituted. Cod liver oil has this regulatory power in a striking degree. It is an extraordinary circumstance that a substance containing neither calcium nor phosphorus should have the power to cause the calcium or the phosphorus, as the case may be, to rise nearly to the level commonly regarded as normal. Furthermore, cod liver oil not only acts as a regulator of the calcium and phosphorus metabolism, but also permits the organism to operate with

greatly increased economy. No less remarkable than the action of cod liver oil, is the clearly demonstrated potency for this purpose of certain types of radiation, such as are present in direct sunlight and which emanate also from the quartz mercury vapor lamp. Because of the similarity of action of cod liver oil and radiant energy, it was predicted that a connection must exist between them. This relation has now been demonstrated. It has been shown that the chemical substances curative of rickets produce a blackening of sensitive photographic plates screened by quartz. Substances non-curative of rickets do not fog the plates. These phenomena are undoubtedly due to ultraviolet radiation. Thus oxidation appears to furnish the basis for the identical curative action of many substances and of sunlight in rickets.—(*Journal A. M. A., Oct. 11, 1924, p. 1169.*)

DIFFERENTIAL DIAGNOSIS OF PULMONARY DISEASE*

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Any discussion relative to the subject of the differential diagnosis of pulmonary disease must necessarily divide itself into two primary and essentially distinct divisions. Of these, the first will deal with pathological lung conditions having the primary and important focus in the pulmonary fields themselves. The second will concern itself with lung pathology dependent upon either specific diseased conditions or abnormal changes situated elsewhere in the human anatomical unit, with the pulmonary disturbance becoming a secondary element to the above mentioned focus or foci as the case may be.

In this paper, limited as to time in the presentation of same, one cannot hope to enumerate, classify and discuss the various diagnostic factors peculiar to individual pulmonary affections. Accordingly, I have only endeavored to bring to you a discussion of certain facts and factors which may be of aid to diagnosis in this particular field.

I do not feel that there exists any system of basic formulae or set rules and regulations of procedure which of themselves, if strictly adhered to, will always lead to the diagnosis of any particular or all pathological conditions which may affect the main organs of respiration. Diagnostic formulae or rules and regulations in the chest field will invariably have a twofold value, namely: the absolute and the relative. This latter will comprise that personal equation which exists between every patient and his pathological process as well as the physician's natural and acquired ability to find, consider and summarize all particulars peculiar to the disease and to the individual attacked. The absolute value will be dependent upon those signs and symptoms which are generally found in varying degrees in individual specific, diseased conditions, regardless of the personal equation heretofore mentioned.

Information obtained from the history, and laboratory aids will to a greater or lesser extent, according to circumstances, enhance either one or both of these outlined values.

There is no infallible norm or status which tallies in every minute particular either in what we term similar diseased conditions or normal individuals. However, pathology of a specific nature does not, generally speaking, vary intrinsically according to its causative factors, for inflammation, consolidation or infiltration, when present in the lungs, remain per se as such, though their etiological elements, whether dependent upon traumatic, micro-organic or other origin, may be vastly different. They do not at any time lose their own inherent specific nature. The infiltrative process will manifest itself through its resultant bronchophony and pectoriloquy, its poorly defined impairment of resonance, moderate breath sound changes and râles of varying types with perhaps variable degrees of breath sound depression. Again, consolidation with its harsh and weakened respiratory murmur, bronchophony and pectoriloquy, circumscribed impairment of the resonance note and the early crepitant râle will transmit itself to us for dissection as to its etiologic factor or pathological entity. Râles are always râles, but seldom, if ever, will they tell us absolutely, by their character alone, the type of micro-organism or the mechanical factor which may be the stimulus to their production.

The mode of onset and the clinical course of the disturbance which has taken place before the patient presents himself before us, if correctly outlined, will many times narrow to small limitations the field of possibilities by consideration of the presumptive chain of evidence connected with individual pulmonary diseases.

The history of the individual case in its entirety is most important. Included in the same must, of necessity, be the time element, a factor which in lung diagnosis is indispensable. Definite diagnoses made without consideration of the disease duration will show a high percentage of error, particularly in subacute and chronic conditions. Information obtained from the patient will, among other things, enlighten us as to family and individual susceptibility.

Relative to symptoms and physical signs which aid in diagnosis, I would stress the statement that I do not feel that there is any dogmatic set of symptoms or of physical signs, or any one set combination of the above, that will be peculiar to each lung disease at all times.

The symptoms produced in the individual case,

*Read before the annual meeting of the Minnesota State Medical Association, St. Cloud, Minn., October, 1924.

as well as the physical signs of disease as found, will depend in a great measure upon the activity of the lesion, its location, the extent of tissue involvement and the patient's individual resistance to the reaction produced. To the above, we must also add the effect of foci remote from the lung fields which in themselves may have constituted the primary lesion with the pulmonary areas being only secondarily involved. This secondary involvement of the lung fields may be of an entirely different pathological nature than the causative primary disease situated elsewhere. However, in certain specific conditions wherein abnormal changes are present in the lungs, the nature of the focus can many times be quite accurately gauged by consideration of the primary remote focus. Especially is this true in cardiac disease, malignancy and acute infectious diseases when their effects become systemic in manifestation. Thus, by a retrograde process, we are enabled to work from effect to cause and thence to true diagnosis.

Passive congestion at the bases of the lungs with reflex inhibition of the diaphragm caused by the acute abdomen is a familiar figure to all of us. Indefinite and minimal abnormal changes in the respiratory murmur in early metastatic malignancy with the primary focus in a remote area of the anatomical machine will, at times, present itself for diagnosis.

Persistent râles in the apex, due to pressure of an intrathoracic thyroid, will lead us astray unless we are mindful to go farther than the pulmonary field itself for etiologic factors.

We are all familiar with the classical physical findings of apical cavitation in the lung with its manifestation through certain individual or a combination of the various abnormal findings produced in this localized area. Personally, I can recall two cases wherein the evidence obtained by physical signs was of a direct nature tending to cavitation, but subsequent knowledge obtained left only the opinion that no cavitation existed and that in reality a tuberculosis of the larynx had produced the above mentioned changes in the area under consideration.

The variation in degree of existing physical signs is one of importance to be noted in pulmonary disease together with their length of duration. A correct understanding of the course pursued, either in retrogression or convalescence, will

make a doubtful primary diagnosis a definite one at subsequent examination.

Effects produced from pathological changes in this field of endeavor will invariably manifest themselves from the symptomatic standpoint, amongst which as being of value, I would mention abnormal temperature or pulse, cough, expectoration, dyspnea, hemoptysis, sweats, gastric symptoms, pain and sputum with its character, content, material and amount.

Relative to pulmonary conditions characterized by infection, it is always well to attempt to learn whether the condition complained of is active or inactive, and, having established this point, we can then proceed to determine the stage—whether it falls into the acute, subacute or chronic category. Accordingly, as the diseases will vary relative to these above divisions, so will the signs and symptoms of specific diseases of the chest vary.

In many acute respiratory infections, it is most difficult, except in occasional cases, to absolutely rule out the presence of tuberculosis at the first examination. When the disturbance has progressed into the subacute or chronic stage, however, the task becomes much easier, for then, by a consideration of the pre-examination clinical course, as outlined by the history, we can often draw conclusions as to what to most probably expect. Especially is this so if there is productive cough, fever, loss in weight and appetite, dyspnea or disturbances in the circulatory system.

Laboratory aid is perhaps the most conclusive evidence relative to specific etiology in the class of infections wherein we have an open lesion, in which event, the causative micro-organism is in the sputum. It is in the closed lesion where the offending micro-organism is not to be located by the microscope that we will experience our greatest difficulty. Personally, I do not recall ever seeing a case of pulmonary tuberculosis with a copious, heavy, purulent sputum which did not, on repeated examination, show the presence of tubercle bacilli. The absence of the tubercle bacillus in sputum of this type must invariably mean non-tuberculous disease. Should the case during its progressive clinical course manifest unmistakable evidence of phthisis, I feel that we have had a primary non-tuberculous condition which has become complicated by the breaking down of old, inactive tubercle or perhaps by new primary tuberculous infection.

Leukocytosis as an indicator of infection will

not tell us of itself whether a single infection of a certain type is present or whether there is a secondary superimposed infection in addition to the primary offending organism. This can well be demonstrated in cases of tuberculosis with concomitant mixed infection or those of the pneumonic type.

Abscess formation will be usually secondary to a primary tissue inflammation wherein the latter is the result of infection or of traumatic origin, or a combination of both.

Bronchiectasis has as its primary causative factor some element capable of weakening the bronchial musculature, thereby giving opportunity for chronic inflammatory disturbance with superimposed infection.

Lung tumor, particularly in its early stages, is shown perhaps best by its compression effects, thereby reducing to a greater or lesser extent the respiratory murmur in a localized area with like secondary smaller changes in the adjacent tissue. Paravertebral pectoriloquy will sometimes direct our attention to the possibility of pulmonary parenchymatous pathology as well as hilus involvement.

Pulmonary disease complicated by the presence of fluid in the pleural cavity will often be obscure as to its real nature until the fluid character is determined and particularly so if the latter should be of the hemorrhagic type.

No one can deny the value of the roentgen ray in this field of medicine and especially when used for confirmatory evidence, even though our knowledge of the etiologic factors may not be enhanced. Generally speaking, I do not feel that the roentgen ray of itself is going to make definite routine pulmonary diagnoses. Its valuable element is its usefulness in determining localization of pathology.

In closing, I would call the clinicians' attention to the following diagnostic aids:

1. Physical signs in determining the presence of pathology and its location and extent.
2. History and symptoms for the understanding of the clinical course of the disease.
3. Laboratory sputum examination in the search for etiologic micro-organisms.
4. Roentgen ray, with the plate to determine the presence of pathology and its extent, particu-

larly as confirmative evidence, and fluoroscopy for its usefulness in the detection of motion with reference to anatomical or pathological structures in the thoracic respiratory apparatus.

DISCUSSION

DR. GEORGE DOUGLAS HEAD (Minneapolis): Dr. Milan very kindly forwarded an abstract of his paper to me, so that while I regret that I am late I have definitely in mind the points that he has made. It is true in almost all diagnostic work in medicine that each case is a study by itself. I am inclined to think that in the past we have attempted to lay too great stress upon some special sign or feature of the case, which has been put forward by one advocate or another as characteristic or diagnostic for the special pathological condition encountered. This certainly is not true, and men of long experience recognize it. They recognize that there are very few well defined pathological findings or well defined clinical signs or symptoms which are of diagnostic value when taken out of the general setting of the whole disease picture.

I am very glad indeed that Dr. Milan approached this whole subject from such a broad standpoint. I personally am of the opinion that the pendulum has swung entirely too far in our attempts to recognize disease of the lungs by the special laboratory procedures which we have in late years been taught to rely upon so strongly. I agree with him absolutely that the *x-ray* studies of the chest, even done by the most expert men, are of only relative value, and are not specifically diagnostic. They are evidence, and sometimes very strong evidence, of pathological change in the lung, but they are rarely diagnostic. Outside of the typical *x-ray* pictures of acute miliary tuberculosis, I know of no pathological condition of the lung that cannot be simulated by one of two or three diseases when *x-ray* studies are made of the patient. I have been painfully aware in my own experience of the very marked limitations of the *x-ray* in attempting to discover early tuberculosis; not that the shadows are not there, but the question arises when a man sees the shadows what is their significance? Is it evidence of a healed, or latent, or active disease, and upon that very point hinges the whole question of the diagnosis.

I think that a history well taken by a man of experience is of very great value. When the patient answers "no" to the question of exposure to tuberculosis in early life, I always follow up that first question with a second one directed to the possibility of exposure which the patient may have forgotten.

For example: Only a few days ago in catechising a patient where I suspected a concealed form of the disease, the patient answered "no" to the question of exposure to a tuberculous infection. "Now," I said, "think back over your early life even when you were a child. Can you remember anyone in your family who had consumption?" To this question she answered "no." Then I said: "Can you remember anyone that visited your home when you were a child who had consumption?" She thought for a minute and then said: "Why, yes. When I was a little girl about six years of age my mother had a personal friend who lived

with us for more than a year. She had consumption and died at our house."

Now that fact was the key to the diagnostic problem. Without that history I doubt very much whether I would have been able to have established beyond a doubt the diagnosis of early tuberculosis; but with that history, plus doubtful signs in the chest, plus x-ray shadows, plus positive tuberculin tests, an exhaustion type of the disease was finally worked out.

So with cases of bronchiectasis, if one goes into the history in detail, one can almost surely get a history of cough with a large amount of sputum at certain times of day. This is very suggestive and quite a different history from the cases of early tuberculosis or other lung conditions.

I consider sputum examination of very great importance, not only from the positive but from the negative side. The presence of tubercle bacilli in the sputum is diagnostic for pulmonary tuberculosis. The absence of bacilli, when repeated examinations are made, is often of great significance. The presence of eosinophiles in the sputum is of great significance in establishing the diagnosis in certain cases of asthma, pollen bronchitis and the like.

Every now and then one comes upon individuals with recurring cough, induced by a bronchitis, that is not bacterial but dependent upon certain pollens in the air. Just such a patient I have just had the privilege of studying, a woman of middle age, living in Iowa, who has been suffering from a cough very difficult to interpret. In this case, the presence of eosinophiles in the sputum and of an increased eosinophilia in the blood (a percentage of six and eight), with negative tuberculin tests assisted greatly in the proper interpretation of the condition.

As I have said, every case of lung disease is a study by itself. A careful history, a thorough physical examination, and well worked out laboratory and x-ray findings all are of importance, the two first mentioned particularly so.

We talk about the importance of surgical diagnosis and the recognition of acute surgical conditions. There is no diagnostic problem that presents itself to the physician which is more important than the recognition of pulmonary tuberculosis early in the course of the infection. I do not know of any surgical disease, except perhaps some of the very acute conditions where life hangs in the balance, in which the decision is of greater importance to the preservation of the life of the individual and the conservation of his usefulness to society. And, yet, I presume if there is any charge to be made against us as diagnosticians it is the fact that year after year we go on overlooking serious lung disease in individuals who come to us when early symptoms first manifest themselves and put them off with a diagnosis of bronchitis, or an infectious cold, or nervous exhaustion, neurasthenia and the like.

DR. L. A. NIPPERT (Minneapolis): Dr. Milan's succinct paper opens up a wider field for discussion.

In the diagnosis of all pulmonary infections, the taking of a complete history is of greatest importance. For instance, the several occupations of the patient must receive attention—a farmer with chronic cough may have been a miner for years, as it happened in one of my cases. The history will also frequently disclose the source of infec-

tion as in pulmonary tuberculosis, parrot-pneumonia, dysentoma pulmonalis.

After the history a complete physical examination is the next step. In the early diagnosis of pulmonary tuberculosis the persistence of a fine r le or squeak in the apex of one lung with a history of failing health is sufficient to establish a working diagnosis. This combination of symptoms and this one sign has frequently enabled me to make a diagnosis before bacilli were found in the sputum.

To the microscope we owe the discovery of the bacillus tuberculosis, the fungus of actinomycosis, the spirillum of Vincent and pulmonary parasites. The presence of pigmented cells may assist us in differentiating heart lesions or tumors from pulmonary tuberculosis. The finding of bronchial casts or of Curschman spirals may aid us to distinguish between fibrinous bronchitis and asthma.

Finally the use of the fluoroscope may prove to be of greatest value. In the farmer-miner case mentioned before, his former occupation of a miner was suspected at once, by the dark spots seen scattered throughout both lungs. Tumors and foreign bodies as causes of lung disease may be disclosed on the screen or on the plate where physical signs fail, as in a patient with a parotid tumor of three months' duration who complained of intense pain in the region of the fifth dorsal vertebra. Suspecting a metastasis, a plate was taken. The result was a surprise as both lungs showed secondary tumors scattered throughout. They had given no subjective symptoms whatever and several physical examinations before and after their discovery were negative. By the use of the fluoroscope we may also eliminate mediastinal and heart affections.

DR. H. LONGSTREET TAYLOR (St. Paul): I still hold that the most important thing in making a diagnosis of any lung condition, is to sit down and talk with the patient. Get that man's history. Get his story of the case. Do not lead him on, but let him tell you, and by the time you are ready to examine him you will find that you already have more than half of your diagnosis.

The x-ray is an exceedingly valuable thing, and those who have practiced for years before we had its assistance know better how to appreciate it than some of the newer ones who have not had that experience. Without the x-ray cancer of the lung was considered to be a very rare condition. Now we know how frequently it is present, and since we have had x-ray pictures of the lungs, it is not mistaken for other conditions as it used to be. An abscess of the lung does not present the same serious problems that it did, now that it can be located positively. In many cases of bronchiectasis, of course, the first whiff of conversation you have with the patient enables you to make a diagnosis of the case.

DR. M. GEORGE MILAN (closing): Mr. Chairman: I am not entirely convinced that persistent r les in an apex always means pulmonary tuberculosis. Pressure from an intrathoracic thyroid as well as a chronic catarrhal apex will often produce evidence of this physical sign, with no pulmonary tuberculosis being present.

Relative to physical signs, it seems to me that we cannot at any time get away from the great value of physical signs. In making these diagnoses, individualization is

necessary at all times and if we individualize every case, we will find that our percentages of correct diagnosis will be on the increase.

Again, as an aid in diagnosis, let us never forget that the lungs are only a part of the general anatomical unit, and during our examination we must take into consideration the system as a whole as well as the localized area where we are having the disturbance as manifested by the physical signs.

In regard to early pulmonary malignancy, during the last few months, I have had the pleasure of seeing four or five cases wherein this condition was present and I want to say that we do get definite physical signs in the pulmonary field in this condition. The early evidence may be present from the standpoint of a change in the respiratory murmur as manifested at times by compression effects either in small or large areas, and again at times by paravertebral pectoriloquy. With such findings present and the knowledge that the patient has a malignant focus elsewhere in the body, a diagnosis of malignancy in the chest should be justified even before the x-ray plate has confirmed such an opinion.

At our clinic, it is the custom, when there is any possible chance, to have the lung man examine the pulmonary fields of surgical cases pre-operatively. We frequently have cases coming for operation, who, following the pulmonary examination, are sent back home with the operation postponed indefinitely on account of the pulmonary condition. I am speaking particularly of the type of surgical cases which can wait a little while and not the acute type, which demands immediate operation with no alternative.

HEXAMETHYLENAMIN

Like the earlier attempts to "disinfect" the alimentary tract through ingestion of selective germicidal substances, the efforts to render the entire organism free from micro-organisms by a similar therapeutic procedure have not been attended with conspicuous success. Hexamethylenamin was early hailed as promising success in these endeavors. It has been recommended as an antiseptic agent for virtually all the body fluids. It was soon demonstrated, however, that bacterial growth is not prevented by it, even in proportions much higher than could be found anywhere in the body. This important evidence rendered it improbable that the administration of hexamethylenamin can exert marked antiseptic effects in the tissues. In an acid solution hexamethylenamin disintegrates into ammonia and formaldehyd, and to the latter substance are doubtless due the beneficial therapeutic results experienced in the treatment of urinary infection. A recent study demonstrates that the alleged beneficial effects of hexamethylenamin systematically in various infectious diseases cannot be explained by the presence of adequate liberation of formaldehyd in the circulation and tissues. The drug itself is not antiseptic; and the hope of securing systemic antiseptis through its use seems forlorn. Its one field of action seems to be in pathologic conditions in the urinary tract, and it is necessary that the urine be markedly acid. (*Journal A. M. A., Nov. 22, 1924, p. 1688.*)

FRACTURES OF THE SPINE*

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This is so large a subject that it is manifestly impossible to embrace it within the confines of a "paper." Neither is this necessary. We have at hand a number of text books which deal with this lesion in a more or less comprehensive manner; none, however, with any desirable degree of completeness or finality. Among the best are those of Cotton¹ and Frazier². It is with the idea of adding my mite to the sum total of the literature which is accumulating especially rapidly during the past few years that I report clinical data and observations of seventy-four cases of fractured spines.

These cases can be classified in various manners, for instance, either as to: (1) anatomic location of the fracture; (2) recent or old; (3) with or without paralysis.

Isolated fractures of the transverse processes, laminæ and spinous processes are not considered in this paper. They are rather rare and their prognosis is invariably good. Neither are there added to this list the pure dislocations nor the pathologic fractures of the spine.

Age and Sex.—The youngest case of this series was seven years old (a case of atlanto-axoid fracture dislocation); the oldest was sixty-seven years of age; nearly all cases occurred during the active period of life (twenty to thirty-five years old). Sixty-four cases occurred in males; eight in females.

Occupation.—In this series, all sorts of occupations were represented. Nearly all large published series of fractures of the spine have been reported from mining communities in which the nature of the injury is of the crushing type (by falling masses of earth, etc.). In this particular series, occupation played no particular part in the etiology of the condition, and injuries of the crushing type were comparatively infrequent.

Manner of Injury.—As above mentioned, there are no "mining injuries" represented in this series. Falls from heights, as from ladders, hay-stacks, bridges, etc., occurred in twenty of the cases. In seventeen cases, the injuries were due to automobile

*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, Minn., Oct. 10, 1924.

accidents. In eight cases, the injury was of the crushing type, while the balance (twenty-nine cases) were due to diving injuries, direct violence, train wrecks, elevator injuries, etc.

Classification of Seventy-four Cases in this Series.—There were twenty-two cases seen within the first twenty-four to forty-eight hours following injury (fresh cases). Fourteen cases were seen from one week to three months following the injury. These can be classed as intermediate; thirty-eight cases can be classed as old cases, having been seen three months or more following the injury. Of these latter, the larger number were seen between one and five years following the injury.

In the fresh cases (twenty-two), paralysis occurred in fourteen. In eight, there existed no paralysis. In the old cases, there existed paralysis in two, no paralysis in thirty-six; and the chief symptom in these old cases was pain and stiffness and more or less disability. In five of the fourteen cases classed as intermediate there existed paralysis, while there was no paralysis in nine.

Diagnosis.—The diagnosis of fracture of the spine can be very easy, or it can be very difficult. When there exists paralysis, a fracture of the spine and its level is usually easily determined. Since the advent of the x-ray, fractures of the spine ought never to be missed. It is surprising that even at this advanced date such a large percentage of fractures of the spine (those without paralysis) escape recognition. Most mistaken diagnoses (according to Cleary⁴) are due to the following:

“1. An erroneous conception that every broken neck or broken back presents symptoms and physical signs so unmistakable as to practically diagnose itself.

“2. Inadequate x-ray examination.

“3. Concentration of attention upon some more apparent complicating lesion.

“4. Failure to get a clear history of the nature and violence of the force, or forces, which the accident brought to bear upon the patient's spine.

“5. Failure to make a thorough physical examination.

“Many non-medical members of the public believe that a broken neck, or a broken back, means either instant death or, at least, paralysis. Careless physical examination lends support to this popular fallacy.”

In this series, about 25 per cent of the cases of fracture of the spine without paralysis were not

previously recognized; the chief reason for this was that x-ray had not been employed. It is necessary to get, in the first place, the history of the manner of the injury. The trauma need not be of extreme severity. Two of the cases in this series were caused from falls on icy sidewalks. In the great majority of the cases, the accident was of some magnitude. Guarded motions of the body, rigidity of the damaged segment of the spine, limitation of motion, tenderness over the area involved, disability (especially as to weight-bearing, lifting and stooping) are all significant symptoms. It is true that an occasional case of fracture (especially in the cervical region) gives no symptoms whatever at a late date. A number of cases of marked fracture dislocation of the cervical spine walked into the office with no further symptoms than a slight amount of stiffness of the neck. The fractures in the neighborhood of the dorso-lumbar region, however, which are so much more common, are usually accompanied by more or less disability. Disability, due to fractures of the dorso-lumbar region, ranged (in this series) from 40 to 100 per cent. The x-ray delivers the final judgment as to the presence, or absence, of a fracture, but the x-ray must be a good one. Indifferent x-rays of the spine lead to error and missed diagnosis. Lateral views are imperative, as well as stereoscopic roentgenograms.

Vertebrae Involved

Cervical,

I.....	1 case	} 27
II.....	2 cases	
III.....	3 “	
IV.....	4 “	
V.....	7 “	
VI.....	7 “	
VII.....	3 “	

Dorsal,

I.....	0 cases	} 33
II.....	0 “	
III.....	0 “	
IV.....	3 “	
V.....	2 “	
VI.....	1 “	
VII.....	1 “	
VIII.....	4 “	
IX.....	1 “	
X.....	2 “	
XI.....	10 “	
XII.....	9 “	

Lumbar,		
I.....	15 cases	} 30
II.....	7 "	
III.....	3 "	
IV.....	1 "	
V.....	4 "	

It will be seen that the region most often involved extended from the eleventh dorsal to the second lumbar vertebra. Frequently the bodies of two vertebræ were broken.

Complications.—Complications occurred in eleven of the cases and, in this series, consisted of fractures. These fractures were usually of the extremities and did not interfere materially with the treatment of the spinal fracture. In sixty-three cases, there existed no complicating injury.

Paralysis.—Twenty-five cases presented paralytic symptoms. Forty-nine did not show any signs of paralysis at any time. In most of the cases, paralysis was total below the segment of the spine involved. In a few, there existed partial paralysis of an extremity. We have again eloquently borne out the statement frequently made that most cases of fracture of the spine are not accompanied by paralysis. In this series, there was no nerve involvement in two-thirds of the cases, while one-third were of the paralytic type.

Deformity.—There existed deformity in thirty-three of the cases. In forty cases, there existed no deformity whatever. Those cases with deformity can be sub-divided as follows:

1. Deformity of the neck (wry neck, etc.) . . . 5 cases
2. Kyphosis 25 "
3. Lateral Deviations of the spine. 3 "

Complaints of Patients.—The chief complaints of patients are listed below. In those patients paralyzed, the chief complaint, of course, was the paralysis of the members involved and the loss of bowel and bladder control. The complaints of the patients in those cases not paralyzed were as follows:

1. Weak back 37 cases
- No weak back. 12 "
2. Stiff back (rigidity) 46 "
3. Inability to lift heavy objects. 40 "
4. Pain 36 "

Fresh Cases.—There were twenty-two cases seen within the first twenty-four to forty-eight hours. Of these, ten occurred in the cervical, seven in dorsal and five in the lumbar region. Of the ten cervical cases, seven were operated upon, one by manipula-

tion and six by laminectomy. The case which was manipulated improved forthwith; paralysis disappeared and the patient is well today. Of the six laminectomies, four died—two of them on the operating table. Two of the cervical cases submitted to laminectomy improved so that they again walked about. In the seven dorsal cases, there were four operations, all laminectomies. In two of the cases no improvement was noted, and in two cases improvement was seen. Of the five cases of lumbar fracture, there were two operations (laminectomies). In neither of these cases was improvement noted. Of the twelve laminectomies done, two died on the table, two died shortly afterwards, four showed improvement, and four showed no improvement.

To summarize, four seemed to derive benefit from the operation and eight did not.

Fresh cases of fracture of the spine with paralysis present one of the most serious and trying problems with which the surgeon has to deal. Set rules can never be laid down. Each patient is a case unto himself.

Cotton¹ says: "As to treatment of fractures or of fracture-luxations with cord damage, there is little to be said that is not open to dispute. In this region, pressure on the cord that suffices to give paraplegia means usually a transverse total lesion of the cord which is beyond the present resources of surgery. Such a lesion means permanent paralysis with death resulting at an interval varying from twelve hours to many months. Here and there, laminectomy or forcible correction without incision has seemed to be the determining cause of recovery, total or partial. In competent hands, either operation is next to harmless and is always justifiable, if not hopeful."

He also says: "Laminectomy in expert hands is not risky, but it is difficult and distinctly a surgeon's operation not to be undertaken by the inexperienced operator, especially if his assistance be not of the best."

Frazier² says: "In considering the indications for operations in injuries of the spine and cord, one must not overlook the benefit that may be derived weeks or months after original injury."

On the following page is reproduced Table XIII, Page 448, in Frazier's book.

This table represents twenty-eight cases operated by various surgeons. Frazier's conclusions from this table are: "From this, it will be seen

that one in four was entirely well, one in four partially incapacitated, one in two and one-half completely incapacitated, and one in nine died subsequent to discharge from the hospital." It is apparent that Frazier is in favor of laminectomy in cases of spinal fracture accompanied with paralysis.

Mixer³ reports sixteen laminectomies, of which four were improved, six were unimproved and six died. It may be said, therefore, that the modern consensus of opinion in these cases of fracture of the spine, with paralysis, seems to be that laminectomy, as a general rule, should be tried after the case has been most carefully studied and if the patient's general condition warrants it. Hyperpyrexia and extremely difficult breathing are the chief contraindications.

In my series, as well as in those of Frazier and Mixer, the percentage of cures following laminectomy is small. Laminectomy still remains a somber chapter in surgery. Nevertheless, without this operation, the outlook is still more gloomy.

liative treatment. In ten of the cases complaining of painful symptoms and rigidity, the ankylosing operations of Hibbs and Albee were recommended following the published papers by Brackett, Mixer and Wilson.⁵ In this series, but one spine was fused by open operation, with complete success.

The treatment of cases without paralysis can be divided into (a) treatment of fresh cases; (b) treatment of old cases presenting symptoms. The profession is pretty well agreed that the fresh cases without paralysis need, above all, rest and recumbency, such as is offered by the Bradford frame. If deformity exists, the attempt should be made to reduce it by gradual means in a manner similar to that used in Pott's Disease. This is usually possible either by increasing the curve of the Bradford frame on which the patient lies, or by substituting a series of felt pads as advocated by Cotton. Ten or twelve weeks of recumbency should be followed by the application of a well-fitting cast and later a brace. Adequate fixation, plus reduction of the deformity, certainly will minimize the degree of

Years between time of accident and report.....	1½	1½-2	2-3	3-4	4-5	5-10	Over 10	Total
Entirely well .....	..	2	1	..	..	3	1	7
Partially incapacitated	1	2	1	1	2	..	..	7
Confined to house.....	1	2	2	2	..	..	..	7
Confined to bed.....	1	..	..	1	2	..	..	4
Died	1	1	..	..	1	..	..	3

Table XIII, Frazier's book.

Old Cases.—There were thirty-eight old cases in my series. Of these, eight involved the cervical spine, fourteen the dorsal spine and sixteen the lumbar spine. The dorso-lumbar region was most frequently involved. It is in this type of case that the condition is often not diagnosed. Twenty-five per cent of this series of old cases were not diagnosed before we saw them, but were called "back strains," "wrenched backs," etc. Nearly all of the cases came on account of disability due to pain, rigidity and inability to lift. In most of the cases, the application of braces for fixation and support afforded relief.

The average disability ranged from 50 to 75 per cent. In a few, there was no disability (cervical spines), while in eight or nine of the dorso-lumbar cases, 100 per cent disability existed, although there was no paralysis. In the severer cases, the application of braces can only be classed as pal-

future disability and probably will render unnecessary later fixation operations.

It is the untreated and unrecognized case that presents the chief symptoms later. Here, there was no intelligent attempt made at immobilization. Callus formation is more abundant than it should be. The deformity is, as a rule, greater than it would have been under proper fixation treatment and the result is a stiff, weak and painful back. Therefore, early recognition of these back lesions is vitally important.

After the case becomes an "old" one, the treatment to be considered lies between the application of a brace or of a fixation operation. On a man presenting a good operative risk, I believe the operative procedure is to be preferred, as the end results so far published seem to warrant an assumption that we have here a method of actual relief of all, or most, symptoms. If operation is refused, or for

any reason impracticable, we must rely on the fixation brace to relieve the affected portion of the spine of as much weight-bearing as possible, as well as of affording rest.

In this connection, it may be well to allude to that form of spinal lesion known as "Kuemmel's Disease." This is a lesion following a trauma of greater or less severity. Consensus of opinion now seems to be that we are dealing here with a crushing fracture of a portion of a body of one vertebra, unrecognized; presenting later a characteristic deformity (abnormal narrowing of the discs as well as of the affected vertebral body), accompanied by symptoms of pain, rigidity and disability, together with a sharp, angular knuckle. History of injury is usually ascertainable on careful questioning.

CONCLUSIONS

1. In fresh fractures with paralysis, laminectomy and forcible reduction throw a slight ray of hope into an otherwise dark future.
2. Fresh cases, without paralysis, need prolonged fixation treatment, which includes the gradual correction of a deformity, if present.
3. All injuries of the spine, no matter how trivial the trauma, demand careful study and liberal use of the x-ray. Failure of diagnosis is today frequent and leads to unnecessary suffering and useless legal complications.
4. Occasional "old" cases, especially in the cervical spine, complain of no symptoms.
5. "Old" cases, as a rule, cause definite symptoms of pain, rigidity and a high percentage of disability. When they do, the fusion operations seem to promise relief of symptoms and reduction of disability.

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DISCUSSION

DR. M. S. HENDERSON, Rochester: Dr. Geist's paper is well worth our serious consideration. These fractures of the spine, of course, are attended with a high mortality. Generally speaking, the higher the fracture is, the more apt the patient is to succumb. Laminectomy is justifiable certainly in most cases, and, although attended with a high mortality, we must remember that there is also a very high mortality without the operation. Of special interest, I think, is the series of cases Dr. Geist showed us without any paraplegia. If, instead of a compression fracture, you have a fracture of the articulating processes and the vertebra slips forward and dislocates, you may get a severe laceration of the cord with a consequent paralysis. In those cases there is no recovery, but in the compression fractures which so often escape observation and are discovered late, paralysis may not develop at all, or may be only transitory.

The subject has an important bearing, from a medicolegal viewpoint. It is well to secure an x-ray of the spine where there has been any severe trauma sustained. Occasionally, particularly where there is a question of compensation concerned, the consultant is confronted with a strong, husky man, who appears to be in perfect health, but complains that he cannot work on account of his painful spine. His spine, on examination, seems movable, and one is apt to conclude that although he is not a malingerer he at least is exaggerating his trouble and as soon as the compensation is settled he will get well. He wanders away and consults someone else, who takes an x-ray and kindly informs you that they have found a compression fracture of one of the lumbar vertebræ. Dr. Geist's bringing up of this subject is very timely, for with the present day method of rapid transit via automobile these fractured spines are sustained not only in railway accidents, but also in the automobile accidents.

DR. A. T. MANN, Minneapolis: This has been a very interesting paper to me. I think there is one thing which may help to classify some of these things a little, and that is that the fractures in the cervical region, in the dorsal region, and in the lumbar region are different. We have three different situations. In the lumbar region the cord stops at the bottom of the first, sometimes at the top of

the second, lumbar vertebra, so that the fractures at the second or below are fractures which involve the cauda equina; that is, fractures which involve the nerves and not the spinal cord proper. Those are very much more hopeful than fractures which involve the spinal cord. We know that we get a great deal of regeneration in the nerve; we get practically none in the cord. So we expect more hopeful results from operation, and operation is indicated in more cases in the lumbar region.

When it comes to the cervical region, fractures above the fourth cervical, which involve the cord, cut off the phrenic nerve and paralyze respiration even of the diaphragm. These cases die and die rapidly. You can expect them to die. In the cervical region one is a little more hesitant about deciding in favor of operation than in some other locations. Some of those cases in which operation is done and there is a new injury to the cord at the operation itself, are more apt to die, too. However, if the laminae are broken, as shown in the x-ray plate, and fragments are pressing on the cord, operation is indicated. This is a very broad subject. The cases which I have not spoken of require a great deal of careful study before a decision for or against an operation can be made.

DR. B. S. ADAMS, Hibbing: I had a case rather recently which illustrates how easy it is to make mistakes in these cases. This man was in a mining accident. He had a fracture of the ischium, dislocation of the shoulder, and numerous cuts and bruises on various parts of his body. He did not complain very much of his back. We x-rayed him, taking of the back only an anterior and posterior view. He was in the hospital for several months, recovered, went home, laid around the house for a month or two, went back to work. He had an easy job watching a pump. Along about that time he began to complain of his back, and we thought naturally that he was making a fuss to get more compensation. It continued, however, and later we brought him back and took a lateral view of his spine which showed a compression fracture of the first lumbar vertebra, which the anterior-posterior view had not shown. If we had not taken it we would probably still have thought he was simply after more compensation, and yet the fellow was injured. But the peculiar part was that the pain in his back did not develop until rather late.

DR. A. R. COLVIN, St. Paul: It so happens that in the course of the last six or eight months, I have seen six cases of compression fractures of the vertebrae which were admitted to the hospital, complaining only of pain in the back. The radiograph in each case showed quite positively compression fracture. Without radiographic study, some of these conditions would have been very difficult of diagnosis.

At a time when I was seeing a considerable number of fractured spines with paralysis at the Ancker Hospital, an extensive review of the subject appeared in the *Ergebnisse der Chirurgie und Orthopädie*, giving the literature of many countries. Summarizing, the author said that surgeons were divided into three classes—"those who would operate on every case, those who carefully selected a case and those who never operated at all. The first group would have a trail of disaster and, perhaps, in a lifetime, have one brilliant result. The last group might, perhaps, miss one opportu-

nity. I confess to belonging to the last group, but I have seen several recoveries which, of course, did not require an operation.

I think that there is one rule that may be safely followed in complete paralysis of both sensation and motion, at a given level occurring immediately at the time of injury: it can be concluded that the cord is destroyed and operation futile.

While at Fort McHenry, a soldier was brought in one night with motion paralysis of the lower extremities, but not complete loss of sensation. All of the consultants, orthopedic, neurologic and general surgeons urged that he be operated upon. It was up to me to make the final decision, and I begged off for a few days and then drifted along a few more. Finally, a month went by and I became quite uneasy, because, in the army hospitals, one felt several kinds of responsibilities. I had seen the patient almost daily and was encouraged to find that about this time he began to move his extremities and finally could lift them from the bed. At this time, a celebrated neurological surgeon came as consultant and I was very eager to have his opinion. He said that if he had seen him immediately after the injury, he would have operated, but because he was recovering now he would not. He then said further that he saw a great many spinal injuries in consultation with the mining surgeons in his state, and he noticed that up to the age of fifty, they were keen to operate on spinal injuries, but after that age they were not.

Most of the cases that I have seen at the Ancker Hospital, and later died, proved at autopsy to have destruction of the cord.

DR. EMIL S. GEIST (closing): I want to thank the gentlemen for the discussion, which was very instructive to me. I am not quite as pessimistic as Dr. Colvin. Certainly, not every fractured spine needs operation, but, as Cotton says, laminectomy in itself is not a very difficult nor very dangerous operation. When we see a poor mortal with a spine fracture lying before us looking for help, we can only say to ourselves, "Is there a chance?" And, granted that the patient is not in extremis, is not breathing hard, has not a high temperature and granted that we have not the history of the immediate, rapid, transverse lesion, I, for my part, believe that the operation gives him an increased chance. Then, we have some published lists to support this view. No one can say that the cases that get well would have gotten well without the operation. I believe there is too much pessimism in the dictum "never operate."

I wanted to call attention to the unrecognized case without paralysis. It is only a few months ago that a discharged soldier came to me; he came for relief for a sore back. He had been thrown by a shell, not injured by the shell itself, but thrown into the air some twenty-five feet by an explosion, and lit on his back. He had been passed from hospital to hospital. He told me he had been at twelve or fourteen various places, and apparently no one had taken an x-ray, because the x-ray showed a clean-cut fracture of a vertebra in the dorsal region; it was an easy case to diagnose. It simply shows how, without the x-ray, eminent surgeons can be thrown off their guard and can miss these cases. As Dr. Adams again pointed out, it is not only the anteroposterior view, but also the lateral view which is most essential in these cases.



W. L. BURNAP, M.D.

Fergus Falls

President of the Minnesota State Medical Association, 1925

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION,
SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN
MINNESOTA MEDICAL ASSOCIATION, AND MINNE-
APOLIS SURGICAL SOCIETY

Owned and Published by

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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VIII JANUARY, 1925 No. 1

EDITORIAL

Origin, Purpose, and Organization of Child Guidance Clinics

In 1921, the Commonwealth Fund of New York adopted a "Program for the Prevention of Delinquency." The policy of this program was as follows:

1. "To develop the psychiatric study of difficult, predelinquent, and delinquent children in the schools and the juvenile courts; to develop sound methods of treatment based on

such study and to provide courses of training along sound lines for those qualified and desiring to work in this field.

2. "To demonstrate in a number of widely scattered cities the value of such psychiatric study and treatment applied to children of this sort referred from juvenile courts, schools, and other agencies.
3. "To develop the work of the visiting teacher whereby the invaluable early contacts (which our school systems make possible) with every child may be utilized for the understanding and development of the child.
4. "To extend by various educational efforts the knowledge and use of these methods."*

This program provided for the combined efforts of four distinct organizations, of which the Division on the Prevention of Delinquency of the National Committee for Mental Hygiene was one. This organization's plan of operation as part of the program has been related to purpose No. 2—to establish demonstration clinics in Child Guidance. These clinics are placed for a period of a year in a community which is adequately equipped medically and socially to carry out the project following the year of demonstration and with an assured purpose to do so. The Child Guidance Clinic operated at the University of Minnesota from November, 1923, to November, 1924, under the direction of Dr. Lawson G. Lowrey, was part of this demonstration program. (See article in this issue of MINNESOTA MEDICINE by Dr. Lowrey.)

The clinic organization consists of a psychiatrist (who is the director), a psychologist, and social workers, as well as the necessary clerical assistants.

The study of a child in the clinic involves the following processes: The social worker secures a complete history of the child's life and his background, both social and biological, covering the patient's personality traits, his reactions, the environmental problems to which he has had to adjust.

The child is then given a psychometric examination by the psychologist to arrive at an index

*"The Understanding and Guidance of the Problem of the Child," Child Health Magazine, Vol. V, Nos. 1 and 2, January and February, 1924.

of his innate intellectual endowment. A physical examination follows. The child is then seen by the psychiatrist in order to secure the child's opinion about his problems and to determine the motivating factors in his behavior.

The results of the various examinations are reviewed and combined in a conference of the entire staff. An opinion is formulated concerning the elements in the child's situation which are causing or contributing to the problem, and suggestions are made regarding corrective possibilities and measures.

This program of Child Guidance Clinics is based on the theory that during early childhood personality traits and habits of conduct are developed and established and that they determine the later behavior of the adult. Studies which have been made of adult criminals indicate that in a large number of the offenders habits of reaction existed in early life which seemed to be definite forerunners of the later criminal actions. Many people who are not violators of the law suffer from inability to carry on a stable social life or use their abilities to the best advantage, due to improper training and development of those abilities. By the time an individual has arrived at maturity his attitudes and habits of action are so fixed that comparatively little can be done to modify them, but in the child there is more opportunity to govern the child's personality development through education of the parents, etc.

The services of such clinics are not confined to actually delinquent children only. Nor are they planned for those children who are frankly feeble-minded, unless the mental defect is complicated by other factors. The clinics encourage studying children who have any of the ordinary nervous reactions or any symptoms of lack of adjustment to the family, school, or general social situations. It is desired to keep the emphasis on preventive work. The experimental nature of the project is not lost sight of. It is admittedly a new field and as such many of its policies and methods are tentative. One of the most important features is the research nature of the work—that of utilizing the cumulative experience of the clinics to increase the fund of knowledge pertaining to this field of endeavor.

M. L. S.

Note: There are at present three Child Guidance Clinics in Minnesota. The one at the University, organized as the Psychopathic Department of the University Hospital under the direction of Dr. George S. Stevenson with headquarters at Room 133, Millard Hall, is at the service of the state at large. Application forms may be obtained at this office and if the case is considered suitable, appointment is made usually two weeks after the application is received for examination of the child. The examination is usually completed in a day.

Arrangements may be made for a visit of the University Clinic to a community for the examination of a group of fifteen to twenty children.

It is contemplated establishing at least one more permanent but part-time clinic elsewhere in the state.

Minneapolis has its own Child Guidance at the Lymanhurst Hospital under the direction of Dr. Smiley Blanton, and the St. Paul Clinic is under the supervision of Dr. M. L. Stiffler at the Wilder Dispensary.

On Organizations

In a civilization so complex as ours organizations are a prime necessity even though at times the enthusiasm for them becomes almost a passion. Government, religion, industry, commerce, the professions, our social intercourse and many activities of less importance are highly organized and rightly so.

The original purpose of organization was undoubtedly protective. Ten men or a hundred or a thousand with a common weal had a much better chance to survive and perpetuate their ideas if banded together. With the natural development of society, the component parts became more aggressive and adopted not only programs of protection but ventured into more assertive activities and some did this last more sensibly than others.

The medical profession found it very much to its advantage and in many instances necessary for its existence to keep pace with the general development of organization. The American Medical Association with its constituent state and county societies is the result.

No doubt to the rank and file of the profession the A. M. A. is a more or less abstract affair, which publishes scientific journals, runs down and exposes

fraudulent patent medicine manufacturers and holds annual meetings at distant points, where a chosen few are permitted to read dry ultra-scientific papers.

The annual meetings of the secretaries of the various state medical associations held in Chicago for a number of years serves to dispel this view of the limited activities of organized medicine. These meetings serve as a clearing house for constructive ideas regarding increased activities on the part of state organizations for the benefit of members.

At the November meeting of secretaries the question of medical defense was brought up as usual but stress was laid not on the desirability of such a feature in the by-laws of a state constitution, but on ways and means for increasing the value of defense features for physicians. As things stand in Minnesota the medical defense of members of the state association is not a complete defense by any means. Inasmuch as no provision is made for the payment of judgments in case of adverse verdicts, the provident physician is forced to duplicate the partial defense provided by the association and carry private insurance elsewhere. Our state society should provide complete protection or none at all. It is generally admitted by those experienced in malpractice suits that the simple fact that the organization of physicians is defending one of its members prejudices a jury from the start. On the other hand the association should be able to provide insurance of this sort much more reasonably than any private company. The present rate of private insurance in Minnesota, however, is not exorbitant. The subject is being investigated by a committee recently appointed and recommendations will be forthcoming at the annual meeting to be held in Minneapolis in April.

The subject of periodic health examinations had its share of attention at the meeting in Chicago. Our state association has not given this subject the attention it deserves. As a result, the individual members have given little attention to the importance of posting themselves on what constitutes a periodic health examination. Those in doubt would do well to obtain some of the forms gotten up after a good deal of thought and trouble by a committee of the A. M. A. and obtainable now at the Chicago headquarters.

To one who is in doubt as to the advantages of a full time secretary for any state association the

size of ours, attendance at one of these meetings of secretaries would dispel such doubt. There are many ways in which a secretary may assist the individual members and the component county societies. Many of our Minnesota societies meet only once in six months. Some counties in Minnesota have only a half dozen physicians and the encouragement to have more frequent meetings, and the grouping of counties into various district societies is important for the medical welfare of physicians in sparsely settled districts. Keeping in touch with legislative activities requires more time than a chairman of a legislative committee can ordinarily devote to such work. If a state association is to include postgraduate extension work throughout the state, the full time of an energetic secretary is essential.

OBITUARY

DR. CARLTON GRAVES

Carlton Graves, member of Minnesota State Medical Association and of American Medical Association, and president of the Aitkin County Medical Society at the time of his death, graduate of the Medical Department of the University of New York, 1878, was the pioneer physician of Aitkin County, having been in continuous practise there since 1882.

He made many long trips by team and sleigh before the railroads came, to the lumber camps of northern Minnesota, on one occasion nearly to the Canadian border where International Falls has since replaced the wilderness, in combating smallpox and other epidemic diseases.

Dr. Graves helped to organize Aitkin County, and served a number of terms as Coroner, Treasurer and Judge of Probate, also as Postmaster at Aitkin, as Surgeon for the Northern Pacific Railway for fifteen years, and as County Health Officer. The latter office he held at the time of his death. He engaged extensively in the logging business, and also in farming, and for many years possessed one of the best herds of Guernsey cattle in the state. His interest in farming and dairying has contributed in no small degree to the development of agriculture in Aitkin County, and he was at the time of his death president of the Aitkin County Farm Bureau.

His success as a physician, his genial personality, and the extent of his activities caused him to be widely known throughout a large section of Northern Minnesota, and his passing will be a cause for regret to all with whom he came in contact.

His death occurred on November 20, after a brief illness from angina pectoris.

J. J. RATCLIFFE,
Secretary Aitkin County Medical Society.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

THE AMERICAN BOARD OF OTOLARYNGOLOGY

The American Board of Otolaryngology was organized in Chicago on November 10, 1924. The following constitute the board of directors: Drs. Harris P. Mosher, Boston, president; Frank R. Spencer, Boulder, Colo., vice president; Hanau W. Loeb, St. Louis, secretary and treasurer; Thomas E. Carmody, Denver; Joseph C. Beck, Chicago; Thomas H. Halsted, Syracuse, N. Y.; Robert C. Lynch, New Orleans; Burt R. Shurly, Detroit; Ross H. Skillern, Philadelphia; William P. Wherry, Omaha. The office of the Board is at 1402 South Grand Boulevard, St. Louis, Missouri.

The board comprises representatives of the five national otolaryngologic associations: the American Otolological Society, the American Laryngological Association, the American Laryngological, Rhinological and Otolological Society, the American Academy of Ophthalmology and Otolaryngology and the Section of Laryngology, Otology and Rhinology of the American Medical Association. The object of the association is to elevate the standard of otolaryngology, to familiarize the public with its aims and ideals, to protect the public against unqualified practitioners, to receive applications for examination in otolaryngology, to conduct examinations of such applicants, to issue certificates of qualification in otolaryngology and to perform such duties as will advance the cause of otolaryngology. The first examination will be held at the time of the meeting of the American Medical Association.

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Officers of the Camp Release District Medical Society for 1925, elected at the annual meeting held in October, are as follows: President, Dr. L. G. Smith, Montevideo; vice president, Dr. A. A. Passer, Olivia; secretary-treasurer, Dr. L. J. Holmberg, Canby.

LYMANHURST AND PARKVIEW STAFF MEETING

The regular monthly meeting of the Lymanhurst and Parkview medical staffs will be held at Lymanhurst School, 1800 Chicago Avenue, Minneapolis, Tuesday evening, January 27, at 7:00 o'clock.

The program for the evening will consist of a symposium on Tuberculosis and Closely Allied Conditions of the Nervous System.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

LYON-LINCOLN COUNTY MEDICAL SOCIETY

The annual meeting of the Lyon-Lincoln County Medical Society was held at Tracy, Minnesota, October 21, and the following officers were elected: President, Dr. J. L. Jacquot, Tyler; vice president, Dr. B. C. Ford, Marshall; secretary-treasurer, Dr. H. M. Workman, Tracy.

Dr. E. T. Sanderson, Minnesota, was elected delegate to the State Medical Association meeting, with Dr. Ward Akester, Marshall, as alternate.

At a meeting of the society held November 24th, a motion was made and carried that the society commend the State Board of Medical Examiners for their action requiring foreign physicians to live one year in the state and declare their intention of becoming a citizen of the United States before appearing before the Board for a license.

MINNEAPOLIS, ST. PAUL AND SAULT SAINTE MARIE SURGICAL ASSOCIATION

The following officers were elected for 1925 at the annual meeting of the Minneapolis, St. Paul and Sault Sainte Marie Surgical Association: President, Dr. Arthur A. Law, Minneapolis; vice president, Dr. David V. Meiklejohn, Fond du Lac, Wisconsin; secretary-treasurer, Dr. John H. Rishmiller, Minneapolis.

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

The annual meeting of the Nicollet-Le Sueur County Medical Society was held Tuesday evening, December 16, 1924, at Le Sueur, Minnesota, with a good attendance.

The election of officers for the coming year resulted as follows: President, Dr. S. Ericson, Le Sueur; secretary, Dr. Geo. T. Baskett, Asst. Supt. State Hospital, St. Peter; treasurer, Dr. F. P. Strathern, St. Peter. Dr. J. E. Le Clerc, the retiring secretary of the society, had served in that capacity for the past twenty years.

Dr. R. M. Phelps, superintendent of the State Hospital at St. Peter, read a paper entitled "Thoughts on Delinquency and Criminality, and Feeble-mindedness," which was discussed by Dr. George Baskett.

The society voted to support the plan of a paid field secretary if it could be made feasible.

RAMSEY COUNTY MEDICAL SOCIETY

At the annual meeting of the Ramsey County Medical Society held in November, the following officers were elected for 1925: President, Dr. E. M. Hammes; vice president, Dr. C. C. Chatterton; secretary-treasurer, Dr. A. G. Schulze.

Because of the Tri-State meeting to be held in St. Paul in October, 1925, the annual St. Paul clinic week will be omitted this year.

ST. LOUIS COUNTY MEDICAL SOCIETY

The St. Louis County Medical Society held its annual meeting in Duluth, October 14. The following officers were elected for 1925: President, Dr. F. H. Magney, Duluth; first vice president, Dr. H. H. Hursh, Grand Rapids; second vice president, Dr. D. J. Paradine, Duluth; secretary-treasurer, Dr. Hilding C. Anderson, Duluth.

OF GENERAL INTEREST

On December 3rd a group of Twin City, Rochester and Duluth physicians met at Rochester to organize the Minnesota Society for the Study of Heart Diseases.

Those present were Doctors Henry L. Ulrich and B. J. Clawson, Minneapolis; F. A. Willius and Roy Barnes, of Rochester; E. L. Tuohy, of Duluth, and E. T. F. Richards, R. Edwin Morris and Charles N. Hensel, of St. Paul.

The purpose of this organization is not only for the study of heart diseases but also in the interest of prevention of heart diseases as well.

At a meeting of the Council of the Minnesota State Medical Association held December 19th, various matters pertaining to the Association were discussed and settled. The dates for the annual meeting of the Association in Minneapolis in 1925 were set definitely for Monday, Tuesday and Wednesday, April 27, 28 and 29, inclusive. Dr. E. A. Meyerding of St. Paul was duly appointed secretary of the Association. It was deemed best to have but one secretary of the Association instead of dividing the office into a general and executive secretaryship as heretofore.

The recent epidemic of smallpox in Minneapolis has attracted considerable attention because of its high mortality. A recent report of the State Board of Health is interesting in this connection. It is not generally appreciated that for the past twenty years there have been over 1,200 cases of smallpox in Minnesota yearly. In 1901 and 1902 there were over 8,000 cases each year and in 1920 and 1921 over 6,000 and 9,000 cases respectively. In 1920 there were fifteen deaths reported and in 1921 the deaths were twenty-five. This year the mortality has been much higher than for the past twenty-five years.

The control vaccination exerts over smallpox is nicely illustrated in the Minnesota statistics. In the last ten years although a total of 586 cases developed in individuals successfully vaccinated, within a seven-year period no fatalities resulted. Of the 1,458 cases successfully vaccinated more than seven years previous to contraction of the disease, only one died. Of the total of 108 deaths all but one had either never been vaccinated successfully or no definite history of vaccination was obtainable.

The rôle of vaccination can easily be judged from the above figures. The immunity to smallpox induced by vaccination is of indefinite duration. It doubtless varies in different individuals.

Prof. E. C. Kendall, who has charge of the chemical division of the Mayo Foundation for graduate study and research in medicine, has been given the Chandler medal, awarded annually by Columbia University, for services to science. Dr. Kendall won the medal for isolating the active constituent of the thyroid. He has been associated with the Mayo Foundation and the Mayo clinic since 1911. The Mayo Foundation is an invested principal of more than \$2,000,000, given to the University of Minnesota by the Drs. C. H. and W. J. Mayo, the income to be used for graduate study and research in medicine.

Ten thousand prominent individuals throughout the United States are offered the opportunity to get well abso-

lutely free by simply submitting a statement of their ailments to Low S. Tin, apparently a Chinaman, residing in Denver. It seems that herbs which have been used successfully in the treatment of all diseases in China for the past 4,000 years have been entirely overlooked by the medical profession in this country. Now we are to have a demonstration of how this different "system" can cure any known disease. Undoubtedly many will take advantage of this kind offer and try out the system which is new in this country. Report has it that certain Chinese herbalists in California, though not licensed to practice medicine for some reason not apparent, cannot be convicted. In some instances report has it that the stores of these Chinamen serve as blinds for narcotic dissemination.

The Rockefeller Institute for Medical Research has announced the release of the drug known as Tryparsamide for use in the treatment of human and animal trypanosomiasis (African sleeping sickness and *mal de caderas*) and selected cases of syphilis of the central nervous system. This action is based on results reported from clinical investigations which have been in progress for several years. The drug will be manufactured by the Powers-Weightman-Rosengarten Co. of Philadelphia, and will become available through the regular trade channels about January 1, 1925. In releasing the drug for the benefit of the public, the Rockefeller Institute desires it to be known that the Institute does not share in any way in profits that may be derived from the sale of the drug and that, with the cordial co-operation of the manufacturers, provision has been made for the maintenance of a schedule of prices on as low a basis as possible.

Radio broadcasting has actually been begun under the auspices of the Hennepin, Olmsted and Ramsey county societies. Each Thursday evening from 7:45 to 8 o'clock an address by some member of the profession is being broadcast by the Gold Medal radio station, WCCO. The program for the first three months, which began December 18th, will be furnished by the following members of the Olmsted and Ramsey county societies:

1. The goiter question—Dr. Robert Earl.
2. Deafness and hard hearing—Dr. W. W. Lewis.
3. The x-ray in medicine and surgery—Dr. R. D. Carman.
4. Advances in preventive medicine—Dr. George D. Brand.
5. The state hospital for crippled children—Dr. Wallace Cole.
6. Wearing glasses—Dr. Frank E. Burch.
7. One thousand years of surgery—Dr. Donald C. Balfour.
8. Focal infections—Dr. George Earl.
9. The value of animal experimentation to humanity—Dr. C. H. Mayo.
10. The value of periodical medical examinations—Dr. Thomas Dickson.
11. Care of the adolescent child—Dr. E. M. Hammes.
12. The undernourished child—Dr. Ray Shannon.
13. Blood pressure—Dr. Edgar Hermann.
14. Tuberculosis—Dr. E. K. Geer.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

HOFFMAN-LAROCHE CHEMICAL WORKS:

Secacornin
Thigenol

INTARVIN CO., INC.:

Intarvin

ELY LILLY & CO.:

Ampules Ouabain, 0.0005 Gm. ($\frac{1}{128}$ Gr.)-Lilly
Hypodermic Tablets Strophanthin $\frac{1}{100}$ Gr.-Lilly
Hypodermic Tablets Strophanthin $\frac{1}{120}$ Gr.-Lilly
Iletin (Insulin-Lilly) U-80

MERCK & CO.:

Benzyl Succinate-Merck

PARKE, DAVIS & CO.:

Ampules Adrenalin Chloride Solution Rx 1, 1:10000,
1 c.c.
Ampules Adrenalin Chloride Solution Rx 2, 1:2600,
1 c.c.
Ampules Adrenalin Chloride Solution 1:1000, 1 c.c.

SHARP AND DOHME:

Hypodermic Tablets Strophanthin ($\frac{1}{200}$ Gr.)-S. and D.
Ergotole
Ampules Ergot, 1 c.c.

E. R. SQUIBB AND SONS:

Insulin-Squibb, 10 Units
Insulin-Squibb, 20 Units

SWAN-MYERS CO.:

Sterile Ampules Mercuric Potassium Iodide, 0.017 Gm.
($\frac{1}{4}$ Gr.)-Swan-Myers

SYNTHETIC DRUG CO., INC.:

Compressible Capsules Mercury Salicylate "Synthetic,"
1 Gr. for Intramuscular Injection
Compressible Capsules Mercury Salicylate "Synthetic,"
 $1\frac{1}{2}$ Grs. for Intramuscular Injection
Compressible Capsules Mercury Salicylate "Synthetic,"
2 Grs. for Intramuscular Injection

WINTHROP CHEMICAL CO.:

Novasurol
Novasurol Ampules

Schick Test-Lederle.—(New and Non-official Remedies, 1924, p. 335.)—A diphtheria immunity test, also marketed in packages of one vial containing diphtheria toxin sufficient for 50 tests; in packages of one vial containing diphtheria toxin sufficient for 100 tests. Lederle Antitoxin Laboratories, New York.

Antidysenteric Serum-P. D. and Co.—(New and Non-official Remedies, 1924, p. 301.)—An antidysenteric serum, also marketed in packages of one syringe containing 20 c.c. Parke, Davis & Co., Detroit.

Barbital-Merck.—A brand of barbital-N.N.R.—(New and Non-official Remedies, 1924, p. 62.)—Merck & Co., New York.

Barbital Sodium-Merck.—A brand of barbital sodium-N.N.R.—(New and Non-official Remedies, 1924, p. 63.)—Merck & Co., New York.

Carbon Tetrachloride-Merck.—Highest Purity "C.P."—A brand of carbon tetrachloride medicinal-N.N.R.—(New and Non-official Remedies, 1924, p. 84.)—Merck & Co., New York.

Cargentos Ointment, 5 Per Cent.—An ointment composed of cargentos (formerly marketed as cargentos new process, New and Non-official Remedies, 1924, p. 343), 1 part; anhydrous woolfat, 19 parts. The H. K. Mulford Co., Philadelphia.

Cargentos Capsules, 3 Grs.—Capsules, each containing cargentos (formerly marketed as cargentos new process, New and Non-official Remedies, 1924, p. 343), 3 grains. The H. K. Mulford Co., Philadelphia.

Diphtheria Toxin-Antitoxin Mixture New Formula (Park Banzhaf's, 0.1 L+ Dose).—A diphtheria toxin-antitoxin mixture (New and Non-official Remedies, 1924, p. 293), each c.c. of which constitutes a single dose, and contains 0.1 lethal dose of toxin properly neutralized with the necessary amount of diphtheria antitoxin; marketed in packages of three 1 c.c. vials representing one immunizing dose; in packages of thirty 1 c.c. vials representing ten treatments; also in packages of one 30 c.c. vial representing ten treatments of three doses each. The H. K. Mulford Co., Philadelphia. (Journal A. M. A., Nov. 1, 1924, p. 1431.)

Nutrivoid Flour.—A vegetable product composed chiefly of unassimilable carbohydrates (Mannans). It contains fat, 0.92 per cent; protein, 4.31 per cent; nonutilizable carbohydrates, 85.37 per cent. Nutrivoid flour is used as a means of filling out restricted diets, as in the Allen treatment of diabetes. It is a non-nutritive food substance used to give bulk to foods, thus serving to satisfy hunger without furnishing nourishment. Nutrivoid Diabetic Flour Co., New York.

Insulin-Squibb.—A brand of insulin (New and Non-official Remedies, 1924, p. 149). It is supplied as insulin-Squibb 10 units (5 c.c. vials containing 10 units in each c.c.), and insulin-Squibb 20 units (5 c.c. vials containing 20 units in each c.c.). E. R. Squibb and Sons, New York. (Journal A. M. A., Nov. 8, 1924, p. 1509.)

Lacto-Dextrin.—A mixture composed of lactose, 73 per cent; dextrin, 25 per cent, and desiccated lemon juice, 2 per cent. The administration of lacto-dextrin is proposed as a means of promoting the growth of the normally present aciduric organisms *B. acidophilus* and *B. bifidus* in the alimentary tract, so as to make them the predominating organisms. It is claimed that this increased growth of acidophile organisms prevents the undue development of putrefactive bacteria and their products. It is claimed that this change in the character of the intestinal flora brings about increased intestinal activity and that this in turn prevents or ameliorates certain conditions commonly ascribed to putrefactive products in the colon. Battle Creek Food Co., Battle Creek, Mich.

Pituitary Extract-Lilly (Obstetrical).—A slightly acid aqueous solution containing the water-soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle. It is tested for oxytocic action on the isolated uterus of the virgin guinea-pig against a standard solution prepared from defatted desiccated posterior lobe powder and adjusted so that its strength is

equal to that of a 5 per cent solution of the fresh posterior lobe of the pituitary gland. For a discussion of the actions and uses, see general article, Pituitary Gland, New and Non-official Remedies, 1924, p. 225. Pituitary extract-Lilly (obstetrical) is marketed in ampules containing 0.5 c.c. and 1 c.c., respectively. Eli Lilly & Co., Indianapolis.

Pituitary Extract-Lilly (Surgical).—A slightly acid aqueous solution containing the water-soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle. It is tested for its pressor action on the blood pressure of mammals and for oxytocic action on the isolated uterus of the virgin guinea-pig against a standard solution prepared from defatted, desiccated posterior lobe powder and adjusted so that its strength is equivalent to that of a 10 per cent solution of the fresh posterior portion of the pituitary gland. For a discussion of the actions and uses, see general article, Pituitary Gland, New and Non-official Remedies, 1924, p. 225. Pituitary extract-Lilly (surgical) is marketed in ampules containing 1 c.c. Eli Lilly & Co., Indianapolis.

Culture Bacillus Acidophilus-Medical Laboratories, Inc.—A broth culture of *Bacillus acidophilus* in bottles containing about 120 c.c. It contains from 250 to 500 million of viable organisms (*B. acidophilus*) per c.c. at the time of sale. For a discussion of the actions and uses, see Lactic Acid-producing Organisms and Preparations (New and Non-official Remedies, 1924, p. 169). Medical Laboratories, Inc., New York. (Journal A. M. A., Nov. 15, 1924, p. 1589.)

Intarvin.—An artificial fat made from fatty acids having an odd number of carbon atoms. Intarvin is composed of the glyceryl esters of margaric acid admixed with small quantities of the glyceryl esters of pentadecylic, palmitic and stearic acids, 82 per cent; liquid petrolatum, 12 per cent; water, 6 per cent. Intarvin is proposed for use in diabetes mellitus on the ground that fatty acids containing an odd number of carbon atoms do not yield ketone bodies on oxidation in the normal or diabetic organism, and that for this reason it may with advantage replace the natural fats in the diet. The evidence indicates that intarvin does not increase the production and may reduce the production of ketones in certain cases; that it has a protein-sparing action; that sugar is formed from it in small amounts only; that it has little, if any, beneficial effect on carbohydrate metabolism in the human organism; that its unpalatable taste is a drawback to its use, and that it may prove useful in the treatment of diabetes in certain cases. Intarvin Co., Inc., Long Island City, N. Y.

Quinine Ethyl Carbonate-P. W. R.—A brand of quinine ethyl carbonate-N.N.R.—(See New and Non-official Remedies, 1924, p. 267.) Powers-Weightman-Rosengarten Co., Philadelphia. (Journal A. M. A., Nov. 22, 1924, p. 1685.)

Secacornin.—Ergotin-Roche.—A solution of the active principles of ergot in a menstruum consisting of distilled water, glycerin and 7.5 per cent of alcohol. One c.c. secacornin corresponds to 4 gm. ergot, U. S. P. The actions and uses of secacornin are the same as those of ergot. It may be given by intramuscular injection. Hoffmann-LaRoche Chemical Works, N. York. (Journal A. M. A., Nov. 29, 1924, p. 1769.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

MEETING OF NOV. 12, 1924

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 12, 1924, at 8 o'clock. The meeting was called to order by Dr. Hamilton, in the absence of the president and vice president. There were 29 members and 2 visitors present.

The minutes of the October meeting were read and approved.

The following resolutions were read by Dr. Arnold Schwyzer in memory of Dr. Archibald MacLaren:

IN MEMORIAM

DR. ARCHIBALD MACLAREN

The members of this Academy, who attended our State Medical Society meeting in St. Cloud, are aware of the deep gloom that was cast over the convention because its President, Dr. Archibald MacLaren, was not able to preside on account of serious illness. The whole profession of the state, as well as the public, was shocked a few days later to hear of his death.

Measured by the highest standards known to our profession, Dr. Archibald MacLaren always occupied a foremost place in medical ethics and progress. He will continue to be so regarded by those who follow him.

Few members of our profession ever obtained such unbounded confidence of their comrades as that enjoyed by Dr. MacLaren. He was wise in counsel, competent and able in the application of surgical and medical measures.

His contributions to surgical literature were always of the highest merit, extremely practical and richly instructive, in which he never hesitated to point out his own mistakes.

He was a successful and stimulating teacher, as hundreds of the graduates of the Medical Department of our University and scores of internes of our hospitals will gladly testify.

Dr. MacLaren took the keenest interest, and kept himself richly informed, in the progress of all science, especially the sciences collateral to those of medicine and surgery, thus making him the broad and liberal-minded man that we knew.

In church, state and medical affairs he was universally trusted on account of his sincerity of purpose and absolute integrity. He enjoyed the confidence of the public as much as that of his own profession.

He demonstrated his loyalty to his country, by offering his services in times of war and performing the duties of Surgeon General of the State.

He was not only one of the originators of this Academy, but one of its staunchest and most faithful members.

The Minnesota Academy of Medicine takes this opportunity to express its keen appreciation of what Dr. Archibald MacLaren has done for it and for the medical societies throughout the nation, and to express their deepest sympathy to his family for the loss which they have sustained.

(Signed): ARNOLD SCHWYZER, M. D.,

H. B. SWEETSER,

JOHN F. FULTON, M.D., Chairman,

Committee.

These resolutions were accepted by a rising vote, and a motion was carried that they be spread on the minutes and a copy sent to the medical journals and to the family.

DR. S. E. SWEITZER showed several lantern slides of smallpox patients at the General Hospital, after which there was a short discussion of the present smallpox situation.

DR. WM. R. MURRAY (Minneapolis) then read his inaugural thesis, entitled, "Visual Field Changes in Normal Pregnancy." Numerous lantern slides were shown.

DISCUSSION

DR. BURCH: I have enjoyed Dr. Murray's paper very much and I think he has done a fine piece of research work. I once started to try to get some material for this same study, but so many patients in late pregnancy had normal vision that they did not care to come in to have fields taken and I got little co-operation.

One of the noteworthy facts, revealed in this series is:

That with the quite uniform contraction of the fields as shown, occurring in approximately nine-tenths of the patients during the last weeks of pregnancy with quite uniform concentric contraction, evidencing considerable pressure, there should be such infrequent evidence of impairment of central vision. In these enlargements of the pituitary gland, the effect of hypertrophy upon the vision is entirely due to mechanical pressure on the overlying chiasm. Therefore, it seems remarkable in this series and in the series published by Dr. Finley and by Dr. Carvill that there should be so very few reports of involvement of the papillo-macular bundles of the optic nerves. This seems to escape involvement in most cases. Dr. Murray, I think, showed only one in which there was a definite scotoma. One would expect, with marked contraction, that this very sensitive portion of the nerve supplying central vision would become involved.

Another outstanding feature is that the primiparæ, in whom the gland is not nearly so enlarged as in the multiparæ, show quite as markedly contracted fields as do the multiparæ. This notwithstanding the statistical evidence that there is practically twice as much enlargement of the gland in multiparæ as in primiparæ.

Whether all cases of hyperplasia of the pituitary gland remain physiological is, perhaps, not proven. I have seen two reports of cases with permanent hypophysis disease following pregnancy, and this leads to the question whether physiological hyperplasia may not become pathological at times, more frequently than we know.

This thesis is a real contribution to the subject of hypophysis disease, or, at least, the physiological changes which occur during pregnancy and their effects upon vision.

DR. FULTON: Dr. Murray has demonstrated by his paper tonight that he is an acquisition which this Society should have obtained many years ago. He has brought out some new points in his paper. He has brought out the fact that there is concentric contraction as well as bi-temple. He has also demonstrated that recovery may be slow after parturition. I have seen one report published in which hypertrophy of the gland remained permanent. Dr. Finley, of Cuba, read a paper on this subject before the International Ophthalmologists' Congress in Washington. He said

that when he started on this investigation he thought it was something new, but he found, on looking up the literature, that other investigators had worked it up with similar findings. It came out in the discussion that Dr. Lancaster and Dr. Maud Carvill, of Boston, had been working along this line with about the same results.

This paper of Dr. Murray's is a highly meritorious one.

DR. A. SCHWYZER: It may seem queer that one not an oculist should discuss a paper of this kind, but it involves physiology, points between physiology and pathology, and it involves obstetrics. What impressed us all was the enormous contraction of the visual fields. This contraction came on in the later months of pregnancy and lasted at times from four to six months after the delivery. In multiparæ you seem to have more swelling of the pituitary gland; still, most of the worst cases of contraction of the visual field were in primiparæ.

If you consider the increase of the gland—about 0.3 of a gram, representing a volume of about 4 drops of water—it is difficult to understand how this little increase in the size of the hypophysis should press on the chiasm. I noticed that the reduction of the field was at times much more from above and also from below. In fact, the constriction was in the main circular. There may be an explanation for this, other than pressure on the chiasma.

We know from the physiology of pregnancy that there is a great activity in the cerebral membranes, especially in the dura. We know that there occurs such a succulence and hyperemia in the dura from congestion, that we have at times an apposition of bone on the inside of the skull, especially anteriorly. This occurs in the later months of pregnancy and especially in younger persons, i.e., primiparæ. If the dura can become so much congested that it causes an apposition of bone, forming distinct plaques, could it not be that here we have the cause of the circular reduction of the optic field, by a pressure or another influence on the optic nerve at the optic foramen? It would explain why it takes several months for the recovery to normal, while the pituitary gland returns to normal very promptly after the child is born. Could it not be that the trouble is at the foramen opticum, where the leptomeninges and the dura meet and envelop the nerve? This appears, *prima facie*, more probable than that the slight increase of the strongly encapsulated pituitary should damage the chiasma, which lies very free above the fibrous capsule of the pituitary and may well be lifted a trifle without any consequence. In tumors of the pituitary with changes in the bony structures of the sella turcica we have, of course, an entirely different mechanism, which consists of a considerable expansion of the bony structures and a vastly greater increase of the size of the pituitary.

DR. LITZENBERG: I thought when the theory of pressure from the pituitary gland was advanced as the cause of this condition, that we might have something akin to the enlargements of the other endocrine glands during pregnancy. The thyroid always enlarges in pregnancy and never quite goes back to normal. In each succeeding pregnancy this enlargement recurs and does not go back to its size before the pregnancy. The suprarenals are stimulated, and we have the corpus luteum of pregnancy in the ovary; but the one that we can study the best is the thyroid. There cer-

tainly is definite evidence that enlargement of the hypophysis takes place in this disturbance of pregnancy.

According to the theory of pressure by the gland, Dr. Murray's conclusions should have been different, but he had to make his conclusions according to his findings. If pressure were the only factor, then the field ought to remain smaller by virtue of this organ never going back to normal.

We will have to look some other place for an explanation of these visual field changes. I don't know but perhaps Dr. Schwyzer's explanation may be at least a hint as to where to look for the explanation. It does not seem to me that the mechanical enlargement of the gland is the only explanation. There may be some physiological change in the pituitary which offers an explanation.

DR. BURCH: I would like to ask Dr. Litzenberg if he does not sometimes find acromegalic symptoms in some cases of pregnancy.

DR. LITZENBERG: They are rather rare, but they do occur.

DR. FULTON: I would like to ask Dr. Murray what percentage of cases have impaired visual fields.

DR. MURRAY (in closing): Every one that I have examined. I do not know that I have very much more to say in conclusion. Dr. Burch mentioned that the papillo-macular bundle does not seem to be affected and yet it is supposed to be the most sensitive of all the fibres of the optic nerve. Perhaps the anatomical location of the papillo-macular bundle has something to do with the explanation. It is the central portion of the optic nerve; it is well within the substance of the optic nerve, and that may protect it to a certain extent.

In regard to Dr. Schwyzer's theory that this may be due to pressure in the optic foramen, I don't believe that it is definitely established that these changes are due to pressure on the optic nerves. If pressure occurs at the optic foramen, then we would expect to find a very marked difference in the two fields. If you will recall the fields shown here, you will remember that we get pretty nearly symmetrical contraction in both eyes. The pressure is apparently on the fibres of each optic nerve and we find a change more or less symmetrical in each eye.

In regard to the return of the fields to normal following parturition, the cases which have been published would give one the idea that all of these cases return to normal within eight or ten weeks. These cases shown tonight do not show it. Some of these cases, as late as four months, show very marked contraction.

These cases show that the fields are more contracted in primiparae than in multiparae, whereas you would expect just the reverse. It may be that in the primipara, where that nerve has not yet been subjected to pressure by the pituitary gland, it is more sensitive; the fields of the primipara thus showing more contraction.

DR. EMIL GEIST (Minneapolis) read a paper entitled, "The Accessory Scaphoid Bone." Lantern slides were shown.

The meeting adjourned.

JOHN E. HYNES, M.D.,
Secretary.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH

THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

THE VALUE OF THE TRUDEAU SANATORIUM'S FIVE DIAGNOSTIC CRITERIA OF PULMONARY TUBERCULOSIS IN NEGATIVE DIAGNOSIS: Lawrason Brown and Fred H. Heise (Amer. Rev. of Tuberculosis, July, 1924). In a previous paper (American Review of Tuberculosis), the writers have discussed this subject, but in the present communication report the verification of their conclusions at that time by a follow-up study of 264 cases with which they have kept in touch for periods varying from one to seven years. The five criteria are: (1) The history of an hemoptysis of a teaspoonful or more; (2) the occurrence of pleurisy with effusion, (3) the presence of persistent moderately coarse râles in the upper half of the chest, (4) a definite parenchymatous x-ray lesion of a tuberculous character in the upper half of the chest and (5) tubercle bacilli in the sputum.

When none of the five criteria was present, pulmonary tuberculosis was said to be excluded. When an hemoptysis occurred of more than a teaspoonful or a pleurisy with effusion without the other criteria a diagnosis of "suspected" pulmonary tuberculosis was made. When both occurred a positive diagnosis was made. The presence of râles without other evidence called only for a diagnosis of "suspected tuberculosis." A parenchymatous x-ray lesion unaccompanied by symptomatic evidence of activity of the disease meant "non-clinical" pulmonary tuberculosis. Subjective symptoms were not used as a basis for diagnosis, but were considered as indicating activity of the disease.

Approximately 2,000 cases were discharged from the Trudeau Sanatorium from 1916 to 1923. In 61 cases the diagnosis was in doubt and in 203 it was negative. In none of the 203 did demonstrable pulmonary tuberculosis develop subsequently unless the occurrence of hemoptysis in three patients (1.5) may be considered as an indication of such development without further corroborative evidence.

In the group of 61 "suspected" cases only two subsequently developed pulmonary tuberculosis, yet temporary râles were heard in 11 cases and permanent râles in seven. Parenchymatous x-ray changes slight in extent and atypical

of tuberculosis were found in 12. Eleven cases gave a history of positive sputum previous to their entrance into the sanatorium which was not verified. Twenty-nine of 44 suspected cases reacted constitutionally and 13 focally, but as noted only two of the entire group of sixty-one suspected cases developed demonstrable clinical tuberculosis.

Besides the 264 negative or suspected cases, 11 were diagnosed as "non-clinical tuberculosis," that is, tuberculous without signs of activity. Three of these failed to react to a repeated subcutaneous dose of 10 m.gm. of O.T. Some had temporary râles at base or apex or slight parenchymatous changes in the x-ray plates. Seven have been discharged less than a year. The others have remained well.

In conclusion, the writers believe that too much stress is placed on toxic symptoms as a basis of diagnosis rather than activity. A patient who fails to react to a repeated dose of 10 mg. of old tuberculin (O.T.) rarely develops active pulmonary tuberculosis.

When the five diagnostic criteria are absent we can safely say that the patient does not have clinical pulmonary tuberculosis.

ARTHUR T. LAIRD

CASES OF MARKED HYPERTENSION, ADEQUATE RENAL FUNCTION AND NEUORETINITIS: Wagener & Keith (*Arch. of Int. Med.*, Sept., 1924). In their work at the Mayo Clinic the authors have recognized a condition which they designate as a distinct entity in cardiovascular disease, and characterized by extreme hypertension, adequate renal function and neuroretinal changes. They differ from Volhard & Fahr in that they apply the term "malignant" hypertension not to those cases of vascular sclerosis which later develop renal insufficiency, but rather to those severe, diffuse vascular cases which do not show renal inadequacy.

The term "malignant" is deserved because of the frequent loss in weight, the dominance of cerebral symptoms and accidents, extreme high blood pressure, severe neuroretinitis, and a serious prognosis.

Volhard & Fahr likewise have applied the term "malignant" hypertension to a class of cases considerably older in average years than the cases cited by Wagener and Keith, which fall more particularly into the age incidence of so-called "essential" hypertension, the difference being the extreme hypertension, tendency to cerebral complications and the retinal changes, with or without evidences of moderate renal dysfunction.

These conditions differ from chronic glomerular nephritis in their high pressure, the absence of anemia, absence of azotemia, and the absence of extensive, diffuse, pathologic lesions in the kidneys.

Renal malfunction in these cases is never severe, although a trace of albumin and a few casts may be apparent. The metabolic alterations are not sufficient to produce abnormal symptoms.

"One of the characteristic evidences of this condition is the severe hemorrhagic and exudative neuroretinitis, which does not usually assume the "snowbank" type nor the macular stars and the extent of the retinitis found in true nephritic cases.

The prognosis in these cases was extremely serious, and eleven patients died within fifteen months of their initial examination at the clinic, only one remaining alive at the present time.

The cerebral symptoms were sufficiently severe to suggest the possibility of cerebral tumor in three cases. In one case a craniotomy failed to reveal a tumor, but necropsies were not permitted to verify the diagnosis.

The determining factor in the production of severe retinitis is not known, but it has been suggested that it occurs with marked contraction of smaller vessels. The course is chronic, and seems to be little influenced by treatment. The extent of visual disturbance depends on the amount of edema present in the macular area, but vision is usually surprisingly good. The authors assume that if the patient lives long enough the retinitis probably heals ultimately, with varying degrees of post-neuritic atrophy, and consequently varying degrees of loss of vision.

The ophthalmoscopic picture may be the earliest evidence of the conversion of an essential into a malignant hypertension, and reveal a serious vascular lesion.

The term "malignant" hypertension in these instances is probably confusing, not because it is inappropriate to call these cases malignant but because of the confusion of the term with the terminology of Volhard & Fahr, which is more or less generally recognized, if not so generally accepted.

F. J. HIRSCHBOECK.

THE PREVENTION AND TREATMENT OF DIGESTIVE DISORDERS OF TUBERCULOUS PATIENTS: John L. Kantor (*The American Review of Tuberculosis*, 1924, ix, 430). After a discussion of the treatment of malnutrition and the anorexia which usually accompanies it, the writer outlines the symptoms and management of the following digestive disorders: Dyspepsia of Phthisis, Early form; Gastric atony and Delayed Gastric Emptying; Tuberculosis of the Intestines, Primary form; Secondary Intestinal Tuberculosis; Perirectal Tuberculosis.

In the early dyspepsia of phthisis there is no organic change in the digestive tract and the symptoms are due to increased irritability of the stomach and bowel. The principles of treatment applicable to any digestive neurosis are here applicable, namely rest, general and local, and general toning up of the automatic nerve control of digestion. Not only appropriate drugs but proper psychotherapy, hydrotherapy and physiotherapy enter into this treatment. For the annoying emetic cough absolute quiet after meals is necessary. The patient must exert his will power to control it. In the gastric atony and delayed emptying of the advanced stages of tuberculosis the author suggests (1) Prevention of gastric distention by limiting the amount of fluid with meals and the use of a concentrated dry diet. (2) Administration of hot water when the stomach is most likely to be empty, as on arising. (3) Aspiration of stagnating

contents followed by brisk lavage about once a week or oftener.

Primary tuberculosis of the intestines is not uncommon in childhood and has a better prognosis than the secondary type of the disease. The author does not favor surgical intervention but recommends a medical treatment consisting principally of absolute rest in bed. In addition systematic heliotherapy is employed.

Despite the fact that manifest tuberculous enteritis is commonly regarded as a precursor of a fatal issue there is very definite evidence that tuberculous ulcers may heal under favorable circumstances. For prophylaxis the author recommends the following measures:

1. The swallowing of tuberculous sputum must be avoided.
2. Hydrochloric acid should be administered in full doses in the subacidity cases. The best way to administer it is to order it sipped (20 to 30 minims in half a glassful of water) during the whole of each meal time.
3. Intestinal stasis should be avoided. This is most apt to occur in the ileo-colic region. The various forms of constipation (atonic, spastic, rectal, due to redundant colon, etc.) must be recognized and intelligently healed.
4. Every case of diarrhea should receive prompt and serious attention. The patient should be put to bed, given a bland, well balanced diet and have warm applications to the abdomen. In some cases irrigations and trans-intestinal flushes may be of value. The Schmidt intestinal test diet is recommended.

A. T. LAIRD.

SYPHILIS AS THE CAUSE OF MUSCULAR ATROPHY OF SPINAL ORIGIN: Ostheimer & Wilson (Amer. Jour. of Med. Sci., June, 1924). Leri, in 1921, made the statement that progressive amyotrophies are most commonly, if not always, syphilitic in origin. Pierre Marie, in 1897, questioned whether there was such an entity as chronic anterior poliomyelitis of a primary nature. In 1905, Dana inferred that nearly all the atrophies were due to parasyphilitic processes, and pointedly remarked that in the early investigation of the syphilitic origin of tabes rather modest statistics were advanced in its support. American text books have not been so enthusiastic in the reception of this view, but Spiller states that there is no objection in accepting syphilis as the possible cause, at least, of primary lateral sclerosis or progressive spinal muscular atrophy. Church and Peterson point out the relative frequency of positive Wassermann tests in these cases. White and Jelliffe do not specifically mention syphilis as the cause.

The authors report five cases of progressive muscular atrophy, all of which conclusively proved to be syphilitic in origin.

They make a plea for a wider recognition of syphilis as the possible cause of amyotrophic conditions, and suggest the reporting of all cases of the amyotrophic form of spinal syphilis, even if associated with tabes dorsalis or paresis. It is suggested that the association is more than casual, and the knowledge derived from a study of these cases, if positive, will, in becoming generalized, lead to the prompt and immediate institution of anti-luetic treatment, just as it is employed today in tabes dorsalis and paresis.

F. J. HIRSCHBOECK.

SURGERY

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SIMPLE EXCISION IN CERTAIN CASES OF DUODENAL ULCER: LeGrand Guerry (Surg., Gyn. and Ob., Vol. 39, No. 3). Duodenal ulcers should be excised whenever possible, excision being sound in basic principle, as it removes the diseased area.

In doing a simple excision, the pyloric sphincter should not be divided unless there is some reason for it, such as when the resultant suture line is in such close proximity to the sphincter that the sphincter action retards rapid healing. In this type of operation the rest of the duodenal mucosa can readily be explored, and should secondary or other ulcers be present, they can be taken care of at the same time. There is no interference with the segmental activity of the stomach in this procedure.

No one operation is suitable in all cases of duodenal ulcer and no one operation will cure all cases.

The author concludes that while he has not done a great number of these operations, the cases in which he has made excision of the ulcer have had very satisfactory results.

W. P. HERBST.

RESTORING LUMEN IN IMPERMEABLE ESOPHAGEAL STRICTURE: King (Surgery, Gynecology and Obstetrics, Nov., 1924). A truly impermeable stricture of the esophagus is uncommon. Many strictures so designated are really not impassable, for while they fail to respond to ordinary bouginage, they later are passed by string swallowing or some other method.

A stricture which completely occludes the lumen of the esophagus and resists all efforts at bouginage is best and most safely treated if it is located at the upper or lower end. The external surgical treatment of strictures of the middle esophagus is fraught with great danger. The technique is very difficult and up to the present time the mortality rate has been exceedingly high. At this time treatment through the esophagoscope gives the best results, and the author presents a case of an impermeable stricture successfully treated by a new method. One esophagoscope was passed from above through the mouth and one from below through an opening in the stomach. The ends were brought as nearly together as possible at the site of the stricture and long biting forceps were used through the upper endoscope to pass through the stricture into the mouth of the lower esophagoscope. All of this was done under close observation through the fluoroscope. Following this a string was passed and the esophagus was gradually dilated successfully by bougies.

J. W. STINSON.

THE PREVENTION OF ACUTE INTESTINAL OBSTRUCTION: Cyrus F. Horine (Ann. of Surg., July, 1924). To reduce the mortality in acute intestinal obstruction, an early diagnosis is necessary and this must be followed by surgical relief before the patient becomes toxic.

Since the beginning of intestinal surgery, the mortality of acute intestinal obstruction has remained almost constant, and not until the cause of the toxemia is controlled can one hope for a lower death rate in these cases.

The author has made a study of 107 cases of acute intestinal obstruction at the Maryland University Hospital, 56 of which died.

This death rate approximates closely the death rate of 840 cases collected by other operators. (Finney, Deaver, Ross and Flint.)

After studying the causes of obstruction in the various laparotomies, the author feels that drainage predisposes to obstruction, especially the drainage in mid-abdominal or rectus incisions. Also drainage in the lower abdomen is more of a predisposing factor than drainage of the upper abdomen because the coils of intestine are permitted to encircle the drains or organized bands and become obstructed.

In definite cases of acute appendicitis and those in which drainage is likely, he feels that a McBarney incision is the one of choice and should the rectus incision be used, he feels that drainage should be made laterally through a stab wound.

In conclusion, he believes that the prevention of a great many cases of obstruction may be obtained by more conservative drainage of the abdominal cavity.

L. D. POWELL.

ABSTRACT OF EXSANGUINATION-TRANSFUSION: L. Bruce Robertson (Arch. of Surgery, July, 1924). The removal of large amounts of blood in various toxemias, with immediate replacement by citrated blood from a healthy donor, has become an established procedure in the treatment of hurn toxemia, erysipelas, acute intestinal intoxication and septicemia, by Robertson, who has performed it over 500 times. The more complete the replacement of the patient's blood with fresh blood the more prompt and lasting is the result, and the necessity therefore for using large amounts of blood precludes the use of the method in adults. It is desirable to secure at least as much blood as it is estimated the child's circulation contains. It is assumed that there are roughly 35 c.c., or a little over one ounce, of blood per pound of body weight. The blood is withdrawn from the donor into 100 c.c. syringes, each containing 10 c.c. of freshly prepared 3.5 per cent sodium citrate solution. This is obtained in advance and kept in a water bath at a temperature of 100 degrees F.

The cannula for the transfusion is tied into a suitable vein, such as at the ankle or elbow, and salt solution is slowly introduced to prevent clotting. The exsanguination cannula is inserted into the superior longitudinal sinus in small infants, or into the femoral vein in older children. In the latter case, a large cannula is introduced into the femoral vein through the saphenous vein, just before it perforates the cribiform fascia.

Blood is withdrawn from the patient until signs of exsanguination begin; this varies in small children from 60 to 160 c.c. With the first sign of weakening pulse, the donor's blood is injected. Thereafter withdrawal and introduction of blood continue simultaneously until all the available blood has been transfused. If the circulation permits, 100 to 150 c.c. more blood is introduced than is removed.

Toxemia from severe burns and scalds, under this treatment, is claimed to have responded better than under any previous method. Many cases which have developed convulsions, formerly usually fatal, have recovered where this treatment has been employed.

Erysipelas, particularly in very young infants, with a mortality of nearly 100%, has been much more successfully treated by this method.

Acute intestinal intoxication, with a mortality of 66% under the usual treatment, has shown a decrease to 42% where this method was employed. Better results were obtained in the later cases, where a larger amount of blood was replaced, and the treatment instituted earlier in the course of the disease.

Drug poisoning was treated in two cases of resorcin poisoning. These were young infants, suffering from severe eczema, treated with 8 per cent resorcin ointment. Three days after this was begun, the babies suddenly collapsed; convulsions and coma developed; carboloria was present. Both cases recovered promptly when exsanguination-transfusion was performed.

Malignant scarlet fever showed a marked improvement in 24 hours after this treatment was used, the toxic symptoms responding promptly.

Septicemia gave fair results, but the number of cases was too small to draw accurate conclusions from.

THOMAS MYERS.

SURGICAL TREATMENT OF TUBERCULOSIS: Everett E. Watson (American Review of Tuberculosis, 1924, x, 9). Dr. Watson reports eight cases in which operative procedures were carried out on the chest of eight tuberculosis patients at Mount Regis Sanatorium, Salem, Virginia. In two cases practically the entire hony thorax on the affected side was removed. One patient is in good condition but has a slight drainage from the wound after seven years. The other patient died after two years, having shown some temporary improvement. Two cases of intrapleural pneumolysis were only partially successful. The sixth to the tenth ribs on the affected side were completely removed in another case. This patient is now at work and apparently in good health. Posterior rib resection was carried out for three more patients, all of whom showed some improvement.

The author recommends the posterior operation in preference to the old and more extensive methods, inasmuch as the mortality is lower and a great part of the operation can be done under local anesthesia. Thoracoplasty cannot supplant artificial pneumothorax, since the latter allows a return of function to the diseased lung.

A. T. LAIRD.

SOME PROBLEMS OF DRAINAGE: Sir Henry M. W. Gray (Surg., Gyn. & Ob., Aug., 1924). In this paper the author discusses the fact that some surgeons do not give enough credit to a patient's natural recuperative powers in cases of abscess formation and drainage is employed more frequently than he believes necessary.

The actual pathological process of localized infection is given in detail and the various forces discussed which come into play to overcome an invading infection. Various complications may arise in drained cases, i.e., sloughing of skin, vessels, bowels, etc. The drainage tube itself may cause (1) collections of bacteria in recesses around the tube, (2) a localized irritation with the formation of a seropurulent exudate prolonging the actual drainage, (3) infection may travel down the tube from the surface. When operating upon an abscess it is best to make the incision large enough to establish free drainage.

In intra-abdominal suppuration an appendiceal abscess was taken as an example of drainage. The remainder of the abdominal cavity is walled off with sponges, the abscess opened widely, its contents evacuated and the appendix removed. The walls of the abscess are swabbed with moistened sponges until clean. Unless there is hemorrhage the abdomen is closed without drainage. If pus is found in the pelvis it is sucked out and the pelvis cleaned with moist sponges until the exudate moistening the sponge is free from foul odor. Loose flakes of lymph are removed, adherent ones not interfered with. The abdomen is closed without drainage. Since the war several hundred cases of acute appendicitis have been operated; one in fourteen was drained. The mortality in drained cases was 90/0, undrained cases 50/0. The two conditions where intra-abdominal drains are indicated are: (1) persistent oozing of blood from the surface of an abscess cavity and a condition of the patient necessitating rapid operation; (2) a shaggy irregular lining covering the surface of the abscess. A rubber drain is usually placed at each angle of the wound down to, but not into, the peritoneal cavity. The author believes secondary abscess formation, fecal fistula, septic pneumonia, etc., complicate drained cases more than those not drained.

In scalps and cerebral wounds in the last war, drainage was instituted to prevent or eradicate infection and do away with cerebral edema. This seemed to promote the evils which were meant to be avoided. Later in the war the missile, if still in, was removed, secondary deleterious matter removed and a drain inserted down to, but not into, the brain tissue. These patients did better and less scar tissue was formed in the brain.

In the cases where injury or infection was around a joint, death or amputation followed many cases where drainage was instituted. Later drainage was placed down to, but not into, the joints and then Willem's treatment was established early and then patient encouraged to move the joint in every way. Here, too, better results were obtained.

The next field is thoracic surgery. The development of thoracic surgery during the war was the result of two methods of treatment of which "no drainage" was one. In sucking wounds, the patient had great respiratory distress and the mortality was high. The patients had to have immediate operation or it resulted fatally. The lacerated

tissues were excised, the wound in the lung attended to, foreign bodies removed, the pleural cavity wiped clean, and the wound closed without drainage. It was found that often-times in cases with no drainage the lung expanded in twenty-four hours, so no difference could be elicited on auscultation. An exploring syringe was introduced every one or two days to see that no fluid collected in the pleural cavity. Some empyema cases had wide excision of a rib, adherent lung freed, pleural cavity cleaned and closure without drainage and good results. It is hoped that it may be proven in the future that drainage of the pleural cavity may be dispensed with as safely as in the abdominal cavity.

L. D. POWELL.

THE TREATMENT OF SPASTIC PARALYSIS: Chas. E. Dowman and Michael Hoke (Arch. of Surgery, July, 1924). 132 cases of spastic paralysis were studied, and were grouped, according to the nerve systems primarily involved, into three types.

1. Pyramidal tract cases.—These present an upper motor neuron paralysis, with spasticity, exaggerated tendon reflexes, patella or ankle clonus, Babinski's reflex, paresis of movements, etc. These develop various deformities, due to muscle contractions.

2. Extrapyramidal cases.—These show involvement of the subcortical motor centers in the corpus striatum, or the lenticular and cordate nuclei. These seem to govern the performance of certain automatic acts and associated movements, even when injury to the pyramidal system results in loss of all voluntary motor power. These cases cause not spasticity, but a rigidity which occurs only on excitement and on effort. Inability to perform co-ordinated movements, such as walking, feeding one's self, grasping and moving an object, as well as athetosis result. The deep reflexes may not be increased; there is no ankle clonus or Babinski.

3. Mixed pyramidal and extrapyramidal tract cases.—These indicate lesions in both systems, and so present symptoms mentioned in both of the above groups.

The treatment used could be applied only to the cases of pure pyramidal tract lesions, as inability to perform co-ordinated movements would render the results useless. A mentality of not less than four years was also considered requisite in order to get favorable results. The treatment consists of three important features, namely:

(1) An attempt to restore proper muscular balance by weakening through neurectomy those groups of muscles which outweigh in muscular strength the opposing groups.

(2) Correction, through orthopedic procedures, of joint deformities and the stabilization of the feet.

(3) Muscle training exercises. Neurectomy is performed close to the entrance of the nerves involved, to the contracted or spastic muscles, and a portion of the nerve resected.

The orthopedic procedures included osteotomy, tendon lengthening or shortening, joint immobilization by producing bony ankylosis, etc.

Daily, regular exercises, with massage, to stimulate the weak muscles, are very essential as after-treatment.

THOMAS MYERS.

PEDIATRICS

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THE PREVENTION OF SCARLET FEVER: Geo. F. Dick, M.D., and Gladys Henry Dick, M.D. (*Journal A. M. A.*, 83-84, 1924). The authors' own negative results and those of previous workers convinced them that animals are comparatively insusceptible to the disease; and that if they were to overcome the obstacle that had blocked the work of other investigators for so many years, it would be necessary to use human volunteers for the production of experimental scarlet fever.

Blood cultures had failed to reveal any organism present constantly enough to indicate a causal relation. In order to verify, so far as possible, their conclusion that the specific organism of scarlet fever is not, as a rule, present in the blood stream, the first volunteers were inoculated subcutaneously with fresh blood serum and fresh whole blood from early cases of scarlet fever. The results were negative.

This experiment furnished evidence that the experimental disease had not been caused by a filtrable virus, but by the hemolytic streptococcus itself. These first cases of experimental scarlet fever were reported Oct. 6, 1923.

Since the hemolytic streptococcus is found in the throat, and is not usually present in the blood, it is evident that the rash is not produced by the direct action of the streptococcus on the skin. And it was important to learn by what means the organism growing in the throat caused the rash. They found that the streptococcus produced a soluble toxin. This toxin is absorbed into the blood, and causes the nausea and vomiting, and the rash.

When small amounts of this toxin are injected into susceptible persons, they may develop general malaise, nausea, vomiting, fever and a scarlatinal rash. These symptoms appear within a few hours after the injection and disappear within forty-eight hours. Following this reaction, the skin test is negative or only slightly positive.

The prevention of scarlet fever, after exposure, is more complicated. In case of definite exposure, skin tests are made as soon as possible. At the same time, a culture of the throat is made on blood agar plates. If the skin test is negative, nothing more is done. In those with positive skin tests, the next step depends on the throat culture. If the plates show no hemolytic streptococci, active immunization is carried out with three doses of toxin. If the throat culture shows hemolytic streptococci, passive immunization is accomplished by injection of convalescent scarlet fever serum. They use convalescent serum to avoid sensitization to horse serum.

R. N. ANDREWS, M.D.

MODERN CONCEPTION OF SCARLET FEVER: Abraham Zingher, M.D., New York (*Journal A. M. A.*, 83-432, 1924). The conception of scarlet fever held by many observers at the present time is that of a local disease of the nasopharyngeal mucous membrane, caused by certain specific strains of the hemolytic streptococcus. A soluble toxin is produced locally, which is absorbed into the system of the patient, and gives rise to the rash and constitutional symptoms.

The Dick test consists of the intracutaneous injection of from 0.1 to 0.2 c.c. of a dilution of the soluble toxic filtrate obtained from a culture of the specific hemolytic streptococcus. The diluted toxin keeps well, and can be distributed in this form ready for the test. The positive reaction begins to appear in from four to six hours, and reaches its maximum in size and intensity within twenty-four hours after the injection. There is a local area of redness, varying in size from a 5 cent to a 25 cent piece. The Dick test is a reliable index of immunity and susceptibility to scarlet fever.

Scarlet fever is a combined toxic and bacterial infection, caused by a specific hemolytic streptococcus. The immunity following an attack of scarlet fever is antitoxic and not to any extent antibacterial. This is shown by the fact that convalescent patients, who give a negative Dick reaction, may develop secondary septic complications produced by the specific streptococcus. A permanent antitoxic immunity following the disease explains the freedom from second attacks of clinical scarlet fever. It is possible, however, that subsequent infections without a rash caused by the specific streptococcus may occur in those who have recovered from an attack of scarlet fever. Such infections may also occur in those who give a negative Dick reaction.

Active immunization with scarlet fever toxin is a safe procedure, and is not to any extent associated with the development of constitutional symptoms, if the dose of the toxin is gradually increased. The amount is most conveniently increased by the skin test dose, the quantity injected representing 100, 250 and 250 skin test doses for children under 12 years, and 100, 250 and 500 skin test doses* for persons over 12 years of age. The injections are given one week apart. The immunity results as shown by the Dick test in checking up on the immunity results with scarlet fever toxin.

Recently the author has been giving 500 skin test doses as the third dose to children over 3 years of age. For adults, 1,000 skin test doses may be used for the third injection. The toxin is diluted so that each cubic centimeter represents 500 skin test doses. The initial dose is 0.2 c.c.; the second dose, 0.5 c.c.; and the third dose, 0.5 or 1 c.c., depending on the age of the person. When a large group is to be injected with the same dose, a dilution of the toxin is made of such strength that 1 c.c. represents 100,250 or 500 skin doses.

The reactions noted have been as a rule largely local and consist of a certain amount of redness and swelling at the site of injection. The second and third doses, although from two and one-half to five times as great as the first one, are followed, as a rule, only by very slight local reactions.

R. N. ANDREWS, M.D.

THE PATHOLOGY OF THE TONSIL: James A. Davis, A.M., M.D. (*Annals of Otolaryngology and Rhinology*, September, 1924). The posterior mass or pharyngeal adenoid tonsil develops first and reaches maturity ordinarily by the fourth year; the lateral or faucial tonsil between the sixth and twelfth years. A distinct involution process is recognizable usually in the last named period. The lateral circular mass or meatal eustachian tonsil is perhaps at its maximum of growth at 13 to 16 years. The anterior mass or lingual tonsil is the last to develop—at 18 to 21 years. The complete cycle of the lymphoid ring development corresponds closely with that of the thymus, pituitary and thyroid group.

Predisposition to infections after tonsillectomy is affirmed by Zahorsky, Sluder and Barnes for the earlier years of life (six months to five years). Barnes has observed that normal tonsils were a help in childhood. Turner says a large ingestion of bacteria is continually going on through the subepithelial lymphatic glands, possibly accompanied by an immunization of the body against their invasion.

After interested and critical attention to the bacteriologic gross and microscopic examination of tonsil tissue presented as surgical and pathologic material from three large Detroit hospitals for a period of five years, also after considerable autopsy work, the author is unable to conclude that tonsil tissue has anything like the degree of pathology attributed to it.

The gross and histopathologic examinations of large groups of tonsils show conclusive evidence that if the same criteria for inflammatory and degenerative changes rendering tissue non-resistant elsewhere in the body are to be applied here, then it is beyond question entirely safe to state most positively: non-pathologic tonsils are removed more frequently and in larger numbers than any other tissue of the body. The indications for removal have, in a great number of instances, received but scant consideration, and scientific data concerning the ultimate end results are very meager when contrasted with the numerical total of tonsillectomies—the most frequently and commonly performed of all surgical operations.

The evidence that the tonsil tissue is biologically an important link in the developmental, protective and mechanical chain of essentials of life, well along into the adolescent period, is most convincing. Its relation to the lymphatic and endocrin systems is quite intimate.

The removal of the posterior (adenoid) and the lateral (palatine) tonsil tissue before the natural maturity period is reached is quite frequently followed by compensatory replacement effort in disadvantageous anatomic positions and by nutritional dysfunctions.

A simple classification of lacunar (cryptic or superficial), parenchymatous and peritonsillar inflammations would aid diagnosis and unify interpretations of the histopathology.

The available defenses of the tonsil may be definitely affirmed as including an intact stratified epithelium, actively hypertrophying and hyperplastic follicles, oxidizing and reducing cellular activities.

Removal of adenoids before four years, and the palatine tonsil before puberty, gives a liability to pathology in development processes and local nutrition efficiency.

R. N. ANDREWS, M.D.

GYNECOLOGY AND OBSTETRICS

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PHENOLTETRACHLOROPHTHALEIN TEST OF LIVER FUNCTION IN THE TOXEMIAS OF PREGNANCY: Judson A. Smith, M.D. (*American Journal of Obstetrics and Gynecology*, 1924, viii, 298). Smith briefly reviewed the history of the phenoltetrachlorophthalein test for hepatic function. The technic of the test, which is essentially that of Rosenthal, was made on twenty normal pregnant women, and on forty-four patients with toxemia of pregnancy, characterized by hypertension and albuminuria, and included eight patients who probably had chronic nephritis, and seven who had convulsions. The average return of the dye for the normal pregnant woman near term was 4 per cent after fifteen minutes, a trace (less than 2 per cent) after one hour, and none after two hours. Occasionally, there was slight retention of the dye in clinically normal pregnant women, that is, 5 per cent after fifteen minutes, 5 per cent after one hour, and none after two hours. Smith believes that the limit of normal is 7 per cent after fifteen minutes, 3 per cent after one hour, and a very slight trace after two hours. In about half of the patients with toxemia, there was a definitely abnormal retention of the dye. Marked albuminuria and severe symptoms, including convulsions, are much more common in this group, and the mortality was much higher than in the group of persons with normal reactions.

It was found that most of the patients with unquestionable chronic nephritis fell into the group of those having normal reactions. Following recovery from the toxemia, there was a return to normal excretion of the dye within two weeks. In a few cases, an improvement in the ability to excrete dye has been observed before delivery. In four fatal cases, in which an abnormal reaction had been obtained, and in which postmortem examination of the liver was possible, some evidence of hepatic damage was found, although it was not always proportionate, even roughly, to the degree of retention of the dye. In one case in which a normal test was obtained, the patient died, and necropsy disclosed slight necrosis of the liver.

Smith concludes that definite abnormal retention of the dye in a case of toxemia of pregnancy indicates that the toxemia is severe, and also that it is of the pre-eclamptic rather than of the nephritic type, but that the degree of retention of the dye does not appear to be a reliable index of the extent of actual necrosis of the liver. A normal reaction, on the other hand, is of doubtful value unless it is obtained several days before delivery, or obtained repeatedly until close to the time of delivery.

L. M. RANDALL.

BEITRAG ZUR KENNTNIS DER ANAMIEN IN DER SCHWANGERSCHAFT: Albert Adler (*Zeitschrift für Geburtshilfe und Gynakologie*, vol. 87, 505). Adler points out the lack of general knowledge with regard to anemia in pregnancy and in the puerperium, and also with regard to the relationship between pregnancy and hematopoiesis. The following classifications are made:

Anemias with pregnancy: Existent anemia or predisposition to anemia as a result of the functional weakness of bone marrow, or changes due to similar diseases of the blood. This group includes:

Chlorosis.

Posthemorrhagic anemia.

Familial hemolytic jaundice.

Pernicious anemia (present before conception).

Leukemias (myelogenous and lymphatic).

Anemia and pregnancy: Relative insufficiency due to hereditary taint, partial toxic hypofunction and dysfunction, or hemolytic action. This group includes:

Physiologic anemia of pregnancy, Grams (the usual condition of the blood in pregnancy).

Pernicious anemia of pregnancy (pseudo-pernicious anemia).

The author asserts that most of the reported cases of true pernicious anemia in pregnancy will not stand close scrutiny. In the cases which fall under the heading "Anemias and pregnancy," Adler finds that in every history it will appear that, at an earlier period in the patient's life, chlorosis, severe anemia, syphilis, or other severe infection had occurred. He sees in this condition a reaction of a functionally weak bone marrow, to a pathologic, and even physiologic influence of pregnancy.

L. M. RANDALL.

ROENTGENOLOGY

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CHRONIC STENOSIS OF THE DUODENUM: N. Ratkoczi (*Amer. Jour. of Roent.*, vol. 12, p. 246, Sept., 1924). In 4,500 gastric examinations the author has observed 29 cases of duodenal stenosis. The "persistent" cases may be due to: (1) adhesions from a laparotomy, tuberculosis, or peritonitis; (2) tumors of the stomach, pancreas, or retroperitoneal glands.

In the roentgen examination of the persistent type, there is a constant but thin flow through the duodeno-jejunal junction. Antiperistalsis is present with return of food into the stomach and there is retention in both the stomach and duodenum.

The "intermittent" cases are due to: (1) movable tumors; (2) pressure of the mesentery or superior mesenteric artery; (3) reflex spasm. During the roentgen examination the contrast material fills the dilated duodenum to the

junction, where it is completely obstructed. Peristalsis and antiperistalsis continue until suddenly the meal pours on into the jejunum. Emptying continues to take place in this manner.

In both types, the duodenum is dilated, the stomach atonic, the Kerkring folds obliterated.

LEO G. RIGLER, M.D.

THE SIGNIFICANCE OF ROENTGENOGRAPHIC PLEURAL ANNULAR SHADOWS: Amberson (*Tubercle*, Aug., 1924). A review of the literature on this subject is presented. The author presents evidence based upon autopsic and clinical evidence as well as roentgenographic to prove that not all annular shadows are due to cavities. If roentgen examination is made at frequent intervals these shadows in many instances can be seen to grow smaller or disappear in a few months. This never occurs with a true cavity, which may grow smaller in a long period of time, but never entirely disappears.

The author believes these shadows are localized pleurisies rather than localized pneumothoraces. Their roentgenographic appearance, location, the clinical accompaniments, the known great frequency of localized pleurisies all tend to indicate that these are isolated areas of pleural inflammation. The known infrequency of lung rupture and the rare occurrence of purulent effusion in these localized areas are evidence against their being localized pneumothoraces. The fact that these shadows increase in size with increase in the lung process beneath them, and fade with subsidence of this activity, also indicates the pleural origin.

LEO G. RIGLER, M.D.

A NEW METHOD FOR ROENTGEN EXAMINATION OF THE DUODENUM: N. Ratkoczi (*Jour. of Radiology*, vol. 5, p. 264, Aug., 1924). Fluoroscopy is sufficient to demonstrate all lesions of the duodenum. The patient is viewed in the lateral position with the rays directed dextro-sinistrally, in the vertical fluoroscope. By this method the bulbous duodeni is clear of the spine, the stomach, the descending portion of the duodenum, the liver and the kidney. It has as its background the hepatic flexure, which, containing gas, gives sharp contrast. The whole duodenum can be seen by rotating the patient slightly to the right or left.

Occasionally filling of the bulb is obtained by having the patient lie on the right side and when necessary the examination can be done in this position. The author believes he can detect the smallest crater in the bulb during the fluoroscopic examination.

LEO G. RIGLER, M.D.

PULMONARY FIBROSIS: Davis (*Radiology*, Aug., 1924). A thorough discussion of the etiology, pathology, roentgen signs, and literature of the various types of this condition is presented.

The author believes that the fibrosis reported as due to intensive roentgen radiation is still not conclusively proven. Primary carcinoma must be differentiated.

LEO G. RIGLER, M.D.

PHYSICIANS LICENSED AT THE OCTOBER (1924) EXAMINATION TO PRACTICE IN MINNESOTA

UPON EXAMINATION

<i>Name</i>	<i>School and Date of Graduation</i>	<i>Address</i>
Brading, Edward Thurston	Harvard, M. D., 1923	Rochester, Minn.
Burns, Arthur	Johns Hopkins, M. D., 1923	Rochester, Minn.
Coffey, Jay Russell	U. of Ore., M. D., 1923	Rochester, Minn.
Felden, Botho	U. Berlin, Ger. Dr. Med., 1914	2012 Hennepin Ave., Minneapolis.
Flothow, Paul Geo.	U. of Pa., M. D., 1923	Rochester, Minn.
Grob, Otto	U. Vienna, Dr. Med., 1923	Rochester, Minn.
Horwitz, Alec	Geo. Wash. U., M. D., 1923	Rochester, Minn.
Kerlanski, Milton	U. of Minn., M. B., 1924	Swedish Hospital, Minneapolis.
McCarty, Virgil	Ind. U. Sch. of Med., M. D., 1924	Ancker Hospital, St. Paul.
Moskovitz, Selic	U. Geneva, Switzerland, Dr. of Med., 1922	1026 Iglehart Ave., St. Paul.
Nelson, Nels Harvey	U. of Minn., M. B., 1924	General Hospital, Minneapolis.
Nutting, Roland E.	U. of Minn., M. B., 1924	General Hospital, Minneapolis.
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Sager, Wm. Warren	Geo. Wash. U., M. D., 1922	Rochester, Minn.
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Bofenkamp, Ferdinand W.	St. Louis U. Sch. of Med., M. D., 1922	Luverne, Minn.
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Critchfield, Lyman Ray	U. of Minn., M. D., 1909	936 Lowry Building, St. Paul.
Duncan, Perry E.	Wash. U., M. D., 1924	St. Luke's Hospital, St. Paul.
Harshbarger, Isaac L.	U. of Va., M. D., 1922	Rochester, Minn.
Horton, Vincent J.	U. of Iowa, M. D., 1923	Preston, Minn.
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BOOK REVIEWS

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ANESTHESIA FOR NURSES. Col. Wm. Webster, D.S.O., M.D., C.M., Professor of Anesthesiology, University of Manitoba Medical School, etc. 153 pages. Illus. Cloth, \$2.00. St. Louis: C. V. Mosby Co., 1924.

LECTURES ON PATHOLOGY. Ludwig Aschoff, M.D., Professor of Pathologic Anatomy, University of Freiburg, Germany. 365 pages. Illus. Cloth, \$5.00. New York: Paul B. Hoeber, 1924.

PHYSICAL DIAGNOSIS. W. D. Rose, M.D., Lecturer on Physical Diagnosis and Associate Professor of Medicine, University of Arkansas; Visiting Physician, Little Rock City Hospital, Baptist Hospital and St. Vincent's Infirmary, Little Rock, Ark. 4th ed. 319 illus. 755 pages. Cloth, \$8.50. St. Louis: C. V. Mosby Co., 1924.

CONCEALED TUBERCULOSIS OR THE TIRED SICKNESS. George Douglas Head, B.S., M.D., Minneapolis. 137 pages. Illus. Cloth, \$2.00. Philadelphia: P. Blakiston's Son & Co., 1924.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES for the fiscal year 1924. 310 pages. Illus. Washington: Government Printing Office, 1924.

GENERAL MEDICINE. The Practical Medicine Series, Vol. I. Edited by George H. Weaver, M.D., Lawrason Brown, M.D., Robert B. Preble, M.D., Bertram W. Sippy, M.D., Ralph C. Brown, M.D. 736 pages. Illus. Chicago: The Yearbook Publishers, 1924.

A PRACTICAL COURSE IN STANDARDIZED PHYSIOTHERAPY, under auspices of Biophysical Research Department of Victor X-Ray Corporation, is now available to physicians. Offers a highly practical knowledge of all the fundamental principles that go to make up the standards of modern scientific physiotherapeutic work. Course requires one week's time. For further information apply to J. F. Wainwright, Registrar, 236 South Robey Street, Chicago, Ill.

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THE SCIENCE AND ART OF ANESTHESIA. Col. Wm. Wilster, Winnipeg. 214 pages. Illus. Cloth, \$4.75. St. Louis: C. V. Mosby Co., 1924.

The author of this book begins his discussion of anesthesia with a very comprehensive review and history of the subject, beginning with the work of the early Egyptians, down to the present methods of anesthesia. The history itself is interesting and entirely worth while reading.

The author then writes to some extent on the physiology of anesthesia, discussing the effects of the various anesthetics used on the heart, blood-vessels, kidneys, nerve tissue, the elimination of the anesthetic and the theories as regards narcosis.

The book then deals with each type of anesthesia and the various anesthetics—ether, chloroform, nitrous oxide, ethylene, ethyl chloride, ethyl bromide, and somnoform—describing the action of each, the advantages and disadvantages of the various anesthetics. The author also has a short chapter devoted entirely to bowel-anesthesia.

One of the finest chapters in the book is the one entitled "Selection of the Anesthetic." This is indeed a worth-while chapter in which the author explains that certain anesthetics will not always suffice for certain types of operations or in every type of individual, regardless of the operation. Therefore we must pick our method of narcosis to suit the condition both from the standpoint of the operation to be performed and the patient.

In closing, the author gives a short discussion of post and pre-operative management, surgical shock, the art of anesthesia, a few statistics comparing the use of the various anesthetics, and lastly the medico-legal aspect of anesthesia.

M. W. ALBERTS, M.D.

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MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association
Northern Minnesota Medical Association and Minneapolis Surgical Society*

VOL. VIII

FEBRUARY, 1925

No. 2

ORIGINAL ARTICLES

FOREIGN PROTEINS AS THERAPEUTIC AGENTS IN THE TREATMENT OF OCULAR INFLAMMATION*

JOHN F. FULTON, M.D.
St. Paul

New therapy measures are always sure to receive close attention from medical society members. As important, however, as therapeutic measures are, it is most unfortunate that so little attention is paid to them in our medical societies or in our medical journals—surgical procedures receiving far more attention.

The foreign protein treatment of ocular diseases has become very popular in recent years and judging from results, as recorded in the vast amount of literature on this subject, has justly earned its reputation.

The now universal recognition of the astonishing therapeutic beneficial results obtained by a number of the foreign proteins, especially milk and tuberculin, for the relief of acute and sometimes chronic inflammatory disease of the eye due to a variety of etiological factors, has been the means of bringing forth others which are producing similar gratifying results as therapeutic agents.

Foreign proteins have been taken from the realm of observation and empiricism and placed in that of applied science as a result of careful work in the laboratory and painstaking analysis of clinical observation, so that the objection to them can no longer be made that we are injecting a substance that we know little about into a body that we know still less about.

I am fully aware that our profession is disposed to become over-enthusiastic over new remedies, which is generally detrimental to the scientific progress of ophthalmology as well as to the public.

Some one has said that all new remedies undergo five stages:

1. The nascent stage.
2. The stage of attention.
3. The stage when the remedy is recorded as infallible.
4. The stage when it is discredited.
5. The last stage, that of sedimentation, when wise and ripe judgment of experts has finally settled the exact place to which the remedy is entitled. I feel that we have about reached the last stage now in regard to the usefulness of foreign protein in the treatment of inflammatory eye troubles.

Every protein injection is followed by two pronounced reactions in the body. One reaction is caused by the toxins contained in the injected fluid and this general reaction manifests itself by elevation of temperature, some nausea, and increased pulse rate. Also, typical focal reactions occur such as flaring up of the tonsils and old inflammatory lesions in the region of the eye and nose.

The therapeutic effect is brought about by stimulation of the involuntary nervous system, and of the bone marrow system, and an increase of the flow of the leucocytes to the affected area, with increased activity of the lymphatic system and permeability of the vascular walls. The stimulation of bone marrow was proven by Müller by laboratory experiments.

Non-specific therapy is effective only in cases where there is an infected area which may be in any part of the body, so these remedies are not confined to ophthalmology for their field of usefulness but are just as important to the general practitioner in medicine and to the general surgeon.

In a splendid paper written by Dr. Carroll DeCourcy, of Cincinnati, he records a number of cases of other diseases from which favorable results were obtained by this same form of therapy, such as chronic arthritis, epididymitis and prostatitis.

*Read before the annual meeting of the Minnesota State Medical Association, St. Cloud, October 9, 1924.

The theories as to how eye symptoms are relieved, and the number of diseases cured by protein therapy, are about as numerous as the authors who have written about them.

Vaughan suggested that the improvement is due to the protein enzymes found in the blood at the time, but, at any rate, protein injections result in the stimulation of the organism, showing that the resulting reaction is the summation of all the forces of resistance with which it is equipped, a rapid increase of the leucocytosis, a powerful stimulation of the glands of internal secretion.

One of the most gratifying results obtained by protein therapy is the relief of pain in all forms of eye diseases associated with inflammation. In many of these cases the analgesic effect is more prompt and more lasting than that produced by morphia.

I have not had an opportunity to try boiled milk in those severe cases of glaucoma for which it is necessary to resort to powerful solutions of eserine and hypodermic injections of morphia in order to control pain. I am inclined to think we might obtain great relief from this treatment as we do in cases of severe irido-cyclitis, in which condition the milk injection obtained its first brilliant success. So the place of protein therapy, not only in ophthalmology but in general medicine, is becoming stronger and more keenly appreciated every year. This gratifying result has been brought about by the painstaking pursuits in our laboratories of physiological chemistry, associated with the careful clinical data.

The great value possessed by the non-specific remedies lies in their ability to stimulate the body resistance to its greatest efficiency, thus bringing about the wonderful results observed and recorded by a vast number of our best known and most reliable observers—a therapeutic shock so to speak; but, if reaction is impossible, the remedy is useless. It is another case of the “all or nothing” principle. They yield all, almost instantaneously, or they yield nothing at all.

The two foreign proteins, to which my attention has been chiefly directed, are milk and tuberculin. The evidence in favor of both of them as being most valuable, powerful and reliable therapeutic agents, as recorded in the medical literature of the last few years, is overwhelming. Those who speak unfavorably in regard to milk seem to be only those who have used it but little, if at all.

Dr. Key, of New York, who has written most favorable literature on the subject of protein therapy, is a good illustration. He says he has used it in two cases only, with unsatisfactory results, and both of them chronic cases.

H. Coffez, a French authority, declares that milk occupies a most important place in the treatment of the eyes and is the most satisfactory of all the substances that have been used. From the very first injection, the pain is relieved and the inflammation and effusion disappears and the pupil dilates. Traumatic hemorrhage and operative hemorrhage in the anterior chamber or vitreous rapidly absorb.

Dr. James M. Patton, in his splendid paper on “The Pros and Cons of Foreign Protein Injections for Affections of the Eye,” reports a case of iridocyclitis, with severe pain and a rapidly advancing plastic exudate, which looked like beginning panophthalmitis, which was relieved in a few hours of pain and irritation by one injection.

This is very similar to a case of my own which I reported in MINNESOTA MEDICINE a few months ago.

Doctor Arganaraz, of Buenos Aires, reports a case of grave panophthalmitis and severe orbital cellulitis which was relieved by three 10 c.c. doses of boiled milk given on alternate days.

Those who have used the milk therapy most seem to have the greatest confidence. Bargy resorted to the use of this remedy in three thousand eye diseases, with most satisfactory results—the pain, edema and secretion disappearing with astonishing rapidity.

The special advantage that milk has is its great richness in alexines and a large variety of enzymes. We have only time to give a very short space to the mode of administration. A small dose should be given at first in order to test the anaphylactic tendencies of the patient. This is usually about 3 c.c. of milk which has been boiled for four minutes and cooled. If this produces little or no reaction, it is followed up with a dose of 10 c.c. on the following day. It may be necessary to repeat this dose three or four times and always intramuscularly on succeeding days.

Some attempts have been made to introduce milder remedies, with a view to bringing about the same results, without producing the severe febrile condition brought about by milk. One of these is aolan. Many favorable cases have been reported

by a number of physicians who have used it. I myself believe that an extract of milk could be worked out which would bring about the same happy results that could be administered in a much more agreeable and convenient way.

Tuberculin now has such a satisfactory reputation for the relief of tuberculous eye diseases that to say anything in its defense seems superfluous. However, so great an authority as Doctor Verhoeff, in discussing a paper written by Doctor Weeks, of New York, read before the American Ophthalmological Society at its 1918 meeting, announced that he had ceased using tuberculin as a remedy in these cases and depended upon hygienic measures for relief.

The harm that this statement might have done to one of the most useful therapeutic agents known to ophthalmology was offset by the reply of Doctor Weeks, in summing up the discussion, in the following words:

"The statement of the last speaker (Doctor Verhoeff), in regard to the use of tuberculin, does not seem to be of very great value. I have had three cases referred to me for enucleation, advised by the people who sent them to me. These patients have at present very good eyes because the careful use of tuberculin was persisted in."

The Tuberculosis Department of our St. Paul Free Dispensary has records of a number of similar cases. Those of you who listened to the lectures of Professor Fuchs, delivered at our State University, will remember his statement that eyes which he formerly enucleated are now saved, with useful vision, by persistent tuberculin treatment.

In the discussion of Doctor Weeks' paper, Doctor Byers, of Montreal, remarked that "when supposedly tuberculous eyes do not react favorably to tuberculin treatment, a reconsideration of the diagnosis is necessary, for it has been my experience, in ocular tuberculosis, that tuberculin, if properly given, seldom, if ever, fails to do good."

I want to refer briefly to the phlectenular group of eye cases. For their relief I am depending upon tuberculin almost exclusively, with the most gratifying results, using locally a solution of adrenalin and butyn for the relief of the photophobia and irritation of the bulbar or lid conjunctiva. I rarely ever resort to calomel or the yellow precipitate, using them only when, through neglect, or a mixed infection, we get an obstinate nebulous condition or a deep seated leucoma. For results I refer you to the Tuberculosis Department of the St. Paul Free Dispensary, conducted by Doctor E. B. Daugherty.

In the tuberculous cases, I quite agree with Parsons in saying that tuberculin treatment is best carried out by a practical bacteriologist who has familiarized himself with the proper technique.

One of the newest of the proteins that offers great hopes of brilliant success is lens antigen in the treatment of incipient cataracts, or, perhaps, in the way of producing immunity to cataracts.

The following are the conclusions that I have arrived at after a most careful survey and study of the literature on this subject and as a result of my own clinical experience:

1. Non-specific therapy is a most valuable and reliable aid in the treatment of all inflammatory conditions of the eye other than those due to syphilis or trachoma.

2. Milk is the most reliable and efficient of all of the foreign proteins in the treatment of acute inflammation of ocular structures due to focal or local infection.

3. Typhoid vaccine and diphtheria anti-toxin are the next most important and in the order named.

4. Tuberculin is our most reliable therapeutic agent for the relief of all forms of tuberculous infection of the eye.

5. Mixed infections are common, in which it is necessary to alternate protein treatment from day to day in order to obtain satisfactory results. Schafer had this in mind when he recommended heterogeneous vaccines.

6. Inasmuch as protein is the active agent in bringing about the curative results of all the remedies above referred to, it is quite likely that each ocular practitioner will obtain the best results with the protein which he has had the most experience in using.

I fully agree with Dr. Benn Witt Key that the time will soon come when the treatment of pneumococcic and staphylococcic infection of the refractive media of the eye will consist in the administration of a foreign protein as soon as it can possibly be injected, just as antitoxin is now demanded in the treatment of diphtheria.

The bibliography of non-specific protein treatment is enormous, a careful study of which indicates that foreign protein therapy marks a very important milestone in the evolution of therapeutics. Only a partial list of the titles of important papers communicated in recent years are herewith attached:

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DISCUSSION

DR. PAUL BERRISFORD (St. Paul): Dr. Fulton's paper should be an inspiration to us coming as it does from a man who though old in experience still retains the enthusiasm of youth. He has seen meritorious remedies acclaimed as revolutionizing panaceas only later to be as extravagantly condemned. Nevertheless he is willing to employ new therapeutic measures and appraise them at their true value.

Although I have had but limited personal experience with parenteral injections of milk, through association with one of my colleagues, who was perhaps the first in the Northwest to administer this remedy, I have seen many injections given and have observed the results obtained. Our observations were practically in accord with workers reporting in the literature and are as follows:

1. In keratitis interstitialis in about half of the cases pain and photophobia are lessened. Milk injections will not prevent the involvement of the fellow eye.

2. In keratoconjunctivitis eezematosa, especially where are multiple ulcerations, milk injections act favorably upon the pain and photophobia. They also improve the general condition of the child although recurrences cannot be prevented.

3. In iritis a beneficial effect is produced in the majority of cases. Anterior chamber opacities and pupillary exudates disappear quickly. In severe cases of tuberculous iritis milk injections exert a helpful influence.

4. In choroiditis disseminata this measure has been seen to raise the visual acuity.

5. Corneal ulcerations in trachoma are in many cases benefited by milk injections although no effect whatever is produced on the trachomatous process.

6. Corneal ulceration, the result of a foreign body, rapidly becomes clean through this remedy and the hypopion quickly disappear.

7. In gonorrheal ophthalmia milk injections exert a most beneficial influence. Where, however, impending corneal perforation is evident they are contra-indicated.

Whatever the eye condition, few there are who have the temerity to employ foreign protein therapy alone and until this is done its exact value will remain unknown. In inflammatory eye conditions where we seem therapeutically impotent the employment of milk injections may prove a very valuable adjuvant.

Milk substitutes, triple typhoid vaccine, caseosan, deuteralbumos, albusol, etc., whatever their added merits may be, have in the hands of the experienced proven no more valuable in the relief of eye conditions than parenteral injections of milk.

DR. WILLIAM R. MURRAY (Minneapolis): Non-specific foreign proteins have proven to be of definite clinical value in some types of acute and subacute ocular involvement, although their use is somewhat empirical. The injection of these foreign proteins produces an increased general defensive reaction, manifested by temperature, increased leucocytosis, with increased lymph circulation, dilated blood vessels and increased diapedesis. The analgesic effect is sometimes quite pronounced.

Various heterogeneous proteins have been used, such as normal horse serum, milk, goat serum, triple typhoid vaccines, diphtheria antitoxin. The most generally used form has probably been milk, injected intramuscularly beginning with 3 to 5 c.c. as an initial dose. Care must be taken not to inject into a blood vessel. Dosage is increased according to the reaction obtained.

Commercial preparations may be used which possess the advantage of standardization of dosage, sterility, availability and suitability for intravenous injection.

During the past two years I have used typhoid serobacterins either intravenously or subcutaneously; for intravenous injections, beginning with a dosage of 50,000,000 and increasing according to the reaction obtained. The reaction is sometimes severe; chills, temperature, increased leucocytosis, headache—lasting for a few hours. This reaction may also be obtained by the subcutaneous method, but in severe ocular inflammations, I prefer the intravenous and keep the patient in the hospital until the reaction has subsided.

The results obtained by the use of non-specific proteins are usually encouraging, but this method of treatment is supplementary to other indicated therapy and should be used in conjunction with it.

The types of ocular infections that seem to be most benefited by the use of foreign proteins are the acute and subacute involvements of the anterior portion of the eye, such as iritis, some forms of corneal ulcers and keratitis, episcleritis, recent anterior vitreous opacities. It has also been used with some benefit in post-operative infections, though I have had no experience with its use in such cases.

I do not believe that foreign protein treatment has yet reached its ultimate place in ocular therapy and we should not be over-enthusiastic in regard to results. It has its indications, and the results are frequently satisfactory, but it must be used as an adjunct to other indicated methods of treatment.

DR. CARL LARSEN (St. Paul): The employment of foreign proteins in ophthalmology I feel has been a real contribution to ocular therapeutics. I believe it was Schmitt of Prague in 1915 who was the first to employ milk in ocular disease. He chose milk because it was easy to

obtain and because its chemical composition was constant, whereas the composition of the different artificial proteins and their derivatives was subject to a great deal of variation. We must bear in mind that milk and all the foreign proteins have their limitations. I believe that the field of usefulness, especially in milk, is in inflammation of the anterior segment of the eye, especially acute inflammation. The best results obtained are: first, in gonorrheal conjunctivitis, and I believe here it is a specific; secondly, in iritis and irido-cyclitis; third, in postoperative infection; and fourth, as a prophylaxis in infections following perforating injury of the eye.

Linder of Vienna, who has done a great deal of work with milk and who is a very renowned bacteriologist, has shown conclusively that in the majority of instances in gonorrheal conjunctivitis the gonococcus is destroyed in from thirty-six to forty-eight hours following milk injection. Our experience has been limited almost entirely to iritis and irido-cyclitis, and it has been astonishing to note the effect on a pupil that is bound down and does not respond to atropin, to find six to eight hours after injection a marked dilatation of the pupil with complete freedom of pain.

We usually give 10 c.c. the first day, 12 to 15 c.c. the second, rest on the third, 10 c.c. on the fourth, and 12 to 15 c.c. again on the fifth day. If there is no reaction after the second or third injection I believe it is useless to attempt further injections. The reaction usually occurs in three to six hours. We have not observed a single instance of anaphylactic shock nor have we had a single infection following its use. I believe there are no contraindications to the use of milk unless it probably is a tuberculous condition. We find a great many men who condemn milk or are rather lukewarm regarding its use, and they argue that milk is not properly standardized, but this is true, with one or two exceptions at least, of all the foreign proteins.

DR. JOHN F. FULTON (closing): I have only a word to say in closing in regard to the points brought out by those who have discussed my paper.

I am extremely grateful to Dr. Murray for his very thorough discussion of the paper, as well as to Dr. Larsen for bringing out and stressing the important practical points in the milk protein treatment of ocular diseases.

Dr. Berrisford referred to the rather unsatisfactory results of this treatment in the phlyctenular group. In our clinic, tuberculin is so perfectly satisfactory in the treatment of this class of cases that we never think of using anything else.

I am extremely sorry that Dr. Benedict is not here to take part in the discussion. It would be extremely valuable to all of us to have had the result of his experience in the use of these remedies in the vast amount of material that he has at his disposal in the Mayo Clinic.

The effects of foreign proteins upon inflamed irises that do not respond to atropin is sometimes marvelous, resulting in complete dilatation of the pupil in a very short time.

In regard to whether or not the local treatment that we formerly resorted to in the treatment of this class of cases is necessary, together with the protein treatment, depends upon the stage of the disease. In the early stages it may not be necessary.

OUR PRESENT KNOWLEDGE OF CANCER*

LOUIS B. WILSON, M.D.
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Cancer is causing an enormous number of deaths in every country in which accurate statistics have been collected. There is a general impression that cancer is very rare among native tribes. It is, of course, impossible to obtain convincing statistics concerning the occurrence of cancer among native races, as for example in Africa, or among the Indians of North or South America, but the almost universal testimony of physicians who have been practising for a long time among the primitive Indian or African races is that they rarely, if ever, see any cases of cancer.

On the other hand, among civilized peoples, whether of homogeneous or mixed origin, where statistics are sufficiently complete to be reliable, the number of deaths from cancer is known to be very large. Dr. F. L. Hoffman, a statistician who has given the subject very long and thorough study, estimates the total deaths from cancer in the United States at from 90,000 to 100,000 annually. This is probably a very conservative estimate, since the census death rate from cancer for 1921, for example, was placed at 100 to each 100,000 of population. In many places where the records are good the rate was much higher, as for example San Francisco, where it was 151.8 for each 100,000. This rate was even exceeded by a city on the western continent, St. John, New Brunswick, where the rate for the same year was 152.6 for each 100,000. Other cities with extraordinarily high death rates from cancer are Albany, Boston, Cincinnati, Des Moines, Los Angeles, Philadelphia, Providence (R. I.), Sacramento, St. Joseph (Mo.), and Springfield (Ill.), all of which had death rates in excess of 120 for each 100,000 population in 1921.

High cancer death rates are not confined to large cities. Tippecanoe County, Indiana, with a population of about 40,000, and in which the only large town is LaFayette, which has a population of about 25,000, had an annual cancer death rate of 123.5 during the ten-year period 1911-1920. In 1917 the county's death rate from cancer was 160, contrasting with a rate of 33.7 for the entire state of Indiana.

It is interesting to compare the present mortality from cancer with the mortality from tuberculosis. In England, for example, cancer is a more fatal disease for women than is tuberculosis. The last statistical bulletin of the Metropolitan Life Insurance Company of New York contains a table based on the experience in what are called the registration states of the United States for 1922, which shows that a child having once reached ten years of age is, according to present indications, in greater danger of dying ultimately from cancer than from tuberculosis. In general in those countries in which by better knowledge of tuberculosis and better methods of fighting it, the death rate has been decreased in the last twenty years, there has been an increase in deaths from cancer which has in many instances more than made up for the decrease of deaths from tuberculosis.

There is also a general consensus of opinion that deaths from cancer have been increasing in all countries in which accurate statistics are available ever since the time when such statistics first became available. Thus in sixty-five years in England the deaths from cancer were apparently multiplied seven times. Dr. Hoffman has combined the death returns from thirty-eight cities of the United States which have a total population of more than 22,000,000 or about one-fifth the entire population of the continental United States. During the four-year period 1912-1915, these cities had a cancer death rate of 37.9 for each 100,000. During the next five years the rate increased to 95.4 for each 100,000 and during 1921 it reached 101.5.

Now, all this apparent increase in cancer mortality may not be real. Some of it may be due to more accurate assignment of causes of death in making out death certificates. But even granting the probability of error, when an apparent increase in the average rate from 38 to 101 for each 100,000 can occur in the thirty-eight principal cities of the United States in ten recent years, during which time much has been done to arouse the public to an active personal interest in the subject, the situation is, to say the least, sufficiently alarming.

Incidentally, it may be remarked that we shall never know the exact facts concerning mortality from cancer or for that matter from many other diseases until people insist on having proper examinations made of the bodies of their dead relatives. At present not more than 2 per cent of the dead in the United States are so examined.

*Presented at a public meeting under the auspices of the Seaboard Medical Association at Rocky Mount, North Carolina, December 3, 1924.

After the increase in the cancer death rate perhaps the most important consideration from the sociologic standpoint is that cancer is most fatal at the period of life when people are most useful. There are certain forms of tumors which cause death in younger and others in older children, but these are comparatively very rare. The old also may be affected with cancer, but the great bulk of mortality from cancer occurs in persons between thirty and seventy years, in other words in the very heart of the period in which they are of most important service to the community. The economic loss is not due to the mortality alone, but to the expense of the care of the sick. Death from untreated cancer is much slower than death from most acute fatal infectious diseases although more rapid than death from many of the chronic functional diseases of the body.

The pain and suffering cannot be estimated. Even with the most satisfactory methods of treatment which have been devised for alleviating these, there is still a considerable basis for the general fear with which most people regard cancer. Much of this fear, however, is really without foundation. For example, there is an all too general belief that cancer is incurable, an absolutely false conception of the disease, which is perfectly curable in its early stages. Our present fear of cancer also is to some extent based on the old belief that cancer is contagious. Indeed, it is less than one hundred years since cancer was regarded as highly infectious and patients with cancer were shunned even by their friends. Fortunately, we have come to know positively that whatever may be the cause of cancer it cannot readily be transferred from one person to another. It is the universal experience of surgeons and nurses who are treating and caring for patients with cancer that they may do so with perfect safety to themselves and to their other patients. Incidentally this is one of the strongest arguments against the theory that cancer is a microbic disease, that is, that it is due to some kind of germ. But we cannot go too far in this direction for we must remember that some kinds of germs may be even more difficult to transplant from one person to another than it is to transplant some of the higher plants, as for example members of the squash family, from one part of the garden to another. The only thing we can be sure of is that in our handling of cancer patients we can disregard any probability

of contracting the disease ourselves or of carrying it to other people.

But if we cannot contract cancer from another person, can we inherit it or the tendency to it from our parents? This question is almost impossible to settle by human statistics owing to the many years in a human generation, to the frequent outcrosses in families and to the unreliability of older statistics. But the questions of heredity are the subject of a large amount of serious laboratory study at present. It may be interesting to summarize here the results of these and other experimental studies to indicate what is being done to solve the vital problems in relation to cancer.

It is only in relatively recent years that we have come to know what inheritance really means and what are its laws. Now, however, as a result of the elaborate studies which have been made on plants and the lower animals, we may speak with assurance concerning many of the laws of heredity. Without going into these in detail, it may be said that it is now possible for the skillful animal or plant breeder to breed into strains of animals or plants certain characteristics until they occur with almost clock-like regularity, a regularity which can be predetermined with great positiveness. In such breeding experiments with either plants or animals, the breeder has found out that certain special characteristics which he is studying tend naturally to increase progressively in the progeny of selected parents, and that there are others which tend naturally to decrease progressively in the progeny of selected parents. These two groups of characteristics the student of heredity designates respectively as dominant and recessive.

In the study of the heredity of cancer by breeding experiments the most thorough and the most important work has been done by Dr. Maud Slye, at the University of Chicago. Slye has used thousands of mice of many different varieties and strains. Each one of her particular breeding strains she has kept under observation before beginning her breeding experiments long enough to know whether spontaneous cancer was occurring in the strain or was not occurring in it. Starting from this accurate foundation, her breeding experiments have consisted in crossing cancer strains with each other, cancer strains with noncancer strains, and noncancer strains with noncancer strains and studying the results in their progeny throughout many

generations. On the pathologic side her work has been carefully checked by Dr. H. G. Wells. Now, there are but three human generations to a century, but there are six mouse generations in a year. On this basis Slye's observations on many single strains of mice extend over more mice generations than would be required in terms of human generations to extend back to the time of the building of the pyramids of Egypt. Her work, which is so monumental and so accurate as to be incontrovertible, has resulted, solely through breeding, in the production of many strains of mice that have never developed tumors in twenty or more generations, in several other strains of mice in which the natural death of all adults is by cancer, and in yet other strains with less degrees of frequency of cancer, but occurring definitely according to the laws of heredity which have been worked out by other observers of the heredity of normal characteristics in animals and plants. The most comforting fact in relation to cancer which Slye's work has shown is that susceptibility to cancer is recessive; that is that it tends to fade out in succeeding generations, while the capacity to resist cancer behaves as a dominant characteristic, tending to become stronger and stronger in successive generations.

Now, may these observations of Slye and other observers on mice and other animals be transferred bodily to the domain of human cancer? In other words, does susceptibility to cancer in man follow the same laws of inheritance that it does in mice? It is beyond doubt that the principles of inheritance are the same in all species of animals as well as in plants. Man is no exception. Cancer in its fundamental respects is the same in man as in other mammals. Therefore, we would seem warranted in concluding that the same laws of heredity which have been shown to hold in spontaneous cancer in the mouse hold also in cancer in human beings. If this is true, why do we not have more evidence of the heredity of susceptibility to cancer in human beings? There is some evidence of inheritance of such susceptibility. There are a few well authenticated instances of cancer families. There are a few well authenticated instances of the occurrence in several members and several generations of a given family of tumors so unusual as to make their identification beyond doubt. On the whole, however, an unusually high incidence of cancer in certain families is very rare. Hunter,

who analyzed a few years ago a very large mass of life insurance statistics concerning mortality of insurees whose parents or blood relatives had died from cancer, says, "In no group has there been a higher death rate than the normal from cancer among sons and daughters, brothers and sisters, fathers and mothers of those who died from cancer." This may be explicable, aside from the grounds of outcrosses and inaccurate histories, in the light of Slye's observations, on the theory that in man susceptibility to cancer behaves as it does in mice as a recessive character; that is that it tends to become of less and less frequent occurrence in succeeding generations. In any event, so far as the applicability to man of Slye's observations is concerned, we would seem to be warranted in the advice that intermarriages between families having a high cancer incidence should be avoided.

Besides the studies in heredity just described, most research into the cause of cancer has been along the lines of (a) transplanting cancer from animal to animal; (b) attempts to produce cancer by artificial means; or (c) the study of the chemistry of the body in the presence of cancer as compared with that of normal persons. It may be interesting to review briefly the results that have been accomplished up to the present along these three lines.

As I have said, the universal experience of surgeons and nurses shows that we may care for cancer patients without any probability of contracting the disease or carrying it to others. It has further been shown that there are no well authenticated instances of the direct transference of cancer from husband to wife or the reverse. A few attempts at the experimental transfer of cancer from one person to another by inoculation have been made and some successes of doubtful authenticity reported. There is, however, a very large body of accurate experiments on the transplanation of cancer from animal to animal. Indeed, there are now several strains of tumors originally spontaneous in the mouse that have been transferred with a high percentage of takes through many generations of mice. In rats there are almost as many series of tumors which have been similarly transferred to other rats as there are those that have been observed in mice. A few strains of cancer in the dog have been transferred to other dogs and a few in chickens have been transferred to other chickens. These cover almost all of the successful transplantations from

animal to animal. The studies, however, have been very elaborate and very extensive. A few results of these stand out as more or less well settled.

In the first place it has been found that it is practically impossible to transplant successfully tumors from animals of one species to those of another species. Indeed, in some instances this peculiarity is confined not to species alone, but to varieties. For example, one cancer found originally in Plymouth Rock chickens after a series of transplants now can be reproduced with 100 per cent of success in Plymouth Rocks, but it has not been transplanted successfully to fowls of any other variety. Similarly, certain tumors that were found originally in a certain variety of mice have not been transplanted successfully in any other variety.

In the second place, it has always been much more difficult to transplant successfully tissue from a spontaneously developed cancer to another animal of the same species than to transplant tissue of a transplanted cancer to another animal. After a strain of cancer has been successfully transplanted a few times the percentage of successful takes slowly rises until in many instances almost 100 per cent of successful takes has been obtained.

In the third place, it has been demonstrated positively that besides variations of susceptibility or resistance between species and varieties there is also a very considerable difference in susceptibility as affected by diet. For example, one observer found that mice in Denmark which had been fed on grain were not susceptible to cancer found in mice from Berlin which had been fed on milk. But when the Danish mice were placed on a milk diet they then became susceptible. One man has found that there is an increased resistance to cancer implantation in animals that are not receiving sugar or fats; another that a diet of wheatbread and corn makes mice highly resistant to implantation of cancer. On the whole, however, we do not know now what are the essential factors of diet. It may be stated, however, that we have no experimental evidence that would support or deny the oft heard statement that a meat diet favors cancer. Indeed, this impression is supported by very contradictory clinical evidence. Thus Ross notes that natives of the arctic regions whose diet is all meat or fish are practically free from cancer. The occurrence of cancer among vegetarian Japanese and natives of India is as great as among those groups of the same races who indulge in a mixed diet.

We hear a great deal nowadays about natural and acquired resistance to infections from bacteria. Indeed, the word immunity, as applied for example to diphtheria, is well understood by everyone. Now, can we produce in animals any such thing as immunity to cancer? Needless to say, many experiments have been conducted along this line. Some encouraging results have been obtained. These have been produced in most instances by inoculation of normal tissue cells. Very extensive attempts at treatment of the human subject by vaccine have been made, but the usefulness of these procedures has not been established. Indeed, it is probable that those successful experiments which have occurred in mice or rats may be explained by the production, and that for only a brief period, of an inflammatory reaction only.

The chief value that has come so far from the transplanting of cancer from animal to animal has been in the opportunity it has afforded of studying microscopically the effect on the cancer of various methods of treatment. Perhaps the most extensive researches of this sort have been made at the Crocker Institute in connection with Columbia University in New York. Dr. Wood, director of the Institute, recently summed up the results of their years of study along this line by saying that up to the present time no difference has been demonstrated between a cancer cell and a normal cell except that a cancer cell has greater capacity for growth than a normal cell. He adds that thus there can be no expectation of influencing the growth of cancer cells by serums, chemicals, or any other biologic means unless we influence the normal cells of the part to an even greater degree. In other words, you cannot expect to kill cancer cells in the body by any means that will not at the same time kill normal cells of the same kind in the same place. This discouraging result of long-continued studies is offset to a considerable extent by the accurate information which has been obtained by observing the exact effects of various agents, for example *x*-ray and radium, in the killing of both normal and cancer cells locally in the body. This information is now available for the physician and has been of great value in the treatment of cancer of human beings by radium and *x*-ray.

The second phase of the study of cancer which I have mentioned is that of attempts to produce cancer in animals without transplanting to them cancer tissue. These in general have been along

three lines: (a) Attempts to produce cancer by the insertion into the body of animals of bits of normal tissue from some other part in the body of the same animal or of bits of normal tissue from other animals of the same species. Such experiments have been very extensive and varied. They have been almost if not quite universally fruitless. The very few reported successes are probably explicable as the coincidental development of spontaneous cancer in the experimental animal and having nothing to do with the experiment. (b) Many observers have attempted to produce cancer in animals by injecting various irritating chemical substances into or under the skin. Many of these substances, particularly those like certain dyes which have a tendency to dissolve fats, will cause, under these circumstances, an active overgrowth of certain of the cells of the part which microscopically cannot be distinguished from true cancer. These overgrowths of tissue, however, usually tend to get well without killing the animal and usually also without being spontaneously transferred to other parts of the animal's body, as almost always happens in true cancer. In a few instances recently some of these experimentally produced cancers have been kept going by irritation with coal tar or its by-products until they have formed secondary growths in distant parts of the animal's body. Thus it would seem that there has now been produced by this form of experiment the counterpart of the cancers which often arise in chimney sweeps and workers in aniline dye factories which use coal tar. Slosse, of Brussels, has recently reported success in delaying the appearance of experimental tar cancers and in accelerating their absorption by injecting under the skin of the animals salts of certain metals, as copper, lead and magnesium. His work contains a suggestion for treatment of this type of cancer, but of course requires much further study. (c) Other attempts to produce cancer have been made by the introduction into some part of the animal's body of substances which would set up a low grade, but very prolonged, chronic irritation. Fibiger, in Denmark, has succeeded in this manner in producing cancer of the stomach in the rat by feeding rats with the bodies of cockroaches which were infested with a small parasitic worm which imbedded itself in the wall of the rat's stomach where it remained alive or dead long enough to set up an extensive irritation in the stomach which ultimately resulted in true cancer of the stomach.

The cancers of the stomach thus produced behave in all respects like spontaneous cancer of the stomach. These results of Fibiger's have been amply confirmed by other observers.

Closely related to these experiments of Fibiger are the more recent ones of Börsch and his associates at the University of Munich. They have succeeded in producing cancer-like tumors in rabbits' ears with great regularity by placing various irritating substances in or under the skin of the rabbit's ear and at the same time closely observing the diet of the rabbits and the relation of tumor development thereto. Their observations seem to confirm and extend the observations of Luden, of the Mayo Foundation, on the relationship of certain chemical substances in the blood to the rate of growth of cancer. Luden had previously shown that a substance called cholesterol, which is present normally in the blood of all persons, is greatly increased in amount in either its "burned" or "unburned" form in persons with cancer. Börsch found that when he fed cholesterol to rabbits which had irritating substances placed in or under the skin of their ears cancer-like tumors developed much more certainly and much more rapidly than they would after similar inoculations in the ears of rabbits not fed with cholesterol. Further he found that cholesterol-fed rabbits with large tumors of the ear rapidly recovered from the tumors when they were given a diet without cholesterol. This recent observation, confirming and extending as it does observations on the conditions of the blood in human patients with cancer, may be of great significance.

Innumerable experiments have been made in attempts to produce cancer by inoculating animals with bacteria or unidentified germs isolated from cancer. In many instances it has been possible to cultivate bacteria or other unidentified microorganisms from cancer tissue. Perhaps the most successful productions of tumors from such cultivations are those by Dr. Erwin F. Smith, who has succeeded with great regularity in producing tumors in certain plants by inoculating them with cultures from tumors of other plants. These tumors microscopically closely resemble in all respects certain tumors in animals. Unfortunately for the conclusions from these experiments Dr. Smith has more recently succeeded in producing similar tumors in plants without the use of any injections of bacteria merely by stimulating them by chemical vapors. The most recently reported

experiments of this sort are those by Dr. Nuzum, of Chicago, who reports having apparently succeeded in producing cancers in mice by the frequently repeated injections extending over a long period of time of a strain of bacteria which he has succeeded in cultivating from tissue in a high percentage of cases of cancer of the human breast. Although Nuzum's experiments have been extensive and conscientious, there are too many possibilities of other explanations of his results to warrant their acceptance at present. The most we may say is that they cannot be ignored and are well worthy of repetition by other observers and with additional precautions in order to preclude error.

Perhaps the most important results of all of our animal experiments on cancer lie in the following observations: (a) prolonged, moderate irritation by either chemical or physical agents has been shown to be a well nigh universal factor in all successful productions of cancer or cancer-like growths in animals, and (b) there is a definite relationship between susceptibility to cancer in animals and the body chemistry of the animals.

Are we warranted from this evidence in assuming that chronic irritation is an essential factor in the production of cancer in man? The following are the facts: A history of prolonged, local irritation of the part later affected by cancer is obtained from many patients with cancer. On the other hand, in many other cases, although not nearly as many as in the former group, no such history of the presence of chronic irritation is given by the patient. All we can say then is that the evidence is sufficiently extensive and convincing that cancer often follows local prolonged irritation to warrant us in advising everyone to avoid such irritations, especially of parts of the skin and of glandular organs of the body. We are not warranted, on the other hand, in saying that chronic irritation is the only cause of cancer, or indeed even that it is an essential cause of cancer. We only know that it is frequently associated with, or immediately precedes, the very earliest indication of cancer of the various organs in man, and that it has been shown to be a marked factor in the experimental production of cancer and cancer-like tumors in animals.

What now are the lessons from our present experimental knowledge of cancer which everyone should take to heart? In the first place we must not be dogmatic. We must concede that our knowledge is very incomplete; that it may be inaccurate;

that we may be drawing conclusions from our experimental observations that are not warranted when applied to conditions as they exist in human beings. But in view of the fact that cancer strikes down many persons at the period of their greatest value to the community; in view of the suffering of those affected by the disease, and in view of the very high and increasing mortality from cancer, we are warranted in giving the following advice even though future studies may show that the information on which it is based was fundamentally wrong.

1. From what we know of the heredity of the susceptibility to cancer in mice, intermarriage between families in which many cases of cancer have occurred should be avoided. This might even be carried so far that children of one or more cancerous patients should be advised not to marry with the children of one or more cancerous parents of another family. On the other hand, the marriage of persons from noncancerous families with those of cancerous families may be safe, because it has been shown that there is a tendency for susceptibility to cancer to disappear in the progeny of cancerous strains united with noncancerous strains.

2. Chronic irritation of any part of the body, but particularly of the skin or of glandular organs, should not be permitted to continue. This is especially true of chronic irritations as evidenced by chronic sores or bleeding of those parts of the body which are known to be most frequently affected by cancer, as for example the lip, breast, uterus or rectum. The seeking of medical advice as soon as such a chronic irritation is observed is fully warranted even if all our suggestions concerning the possible relationship to cancer are wrong, because such a course would bring to the physician or surgeon much earlier than at present many cancers which neglected would result in suffering and death, but taken early might be cured.

3. All unusual or unexplained lumps or tumors of the body, whether they give evidence of chronic irritation or not, should also be brought to the attention of the family physician as soon as they are observed. If they are not cancer, fear will be removed; if they are cancer, the hope of success of treatment will be greater the earlier they are diagnosed.

When a person suspects that a cancer is forming in some part of the body, it is his or her first duty to go immediately to a competent physician. This

does not necessarily mean a surgeon. There are many physicians who do not operate, but who are quite competent to direct a patient to the nearest surgeon who they think is competent to perform a surgical operation if one is needed. The important thing is not to delay, and, I may add, not to tolerate delay on the part of the occasional physician who unnecessarily procrastinates in his diagnosis. For the greatest hope of success in the cure of cancer lies in early surgical operation. With the exception of a few rare tumors of the sarcoma type which occur in the young, almost every cancer can be cured by early and thorough operation. Indeed, about 25 per cent even of developed cancers are now cured by surgery. The trouble is so many people are unaware of, or wilfully shut their eyes to, the definite warnings that nature gives of the beginnings of cancer, and do not present themselves for diagnosis and treatment until the cancer is not only large locally, but has extended also to other parts of the body.

There has been a great advance in recent years in our treatment of cancer. Thirty-five years ago, Dr. Agnew, Professor of Surgery at the University of Pennsylvania, stated publicly that he had never cured a patient of cancer of the breast. Now, in good clinics, nearly half the patients who have been operated on for cancer of the breast are free from any recurrence of the disease years after the operation. And there has been equal progress made in the treatment of cancer in the other parts of the body. If only public and personal interest in the subject of cancer were sufficiently aroused so that every man and woman would present themselves for examination at the earliest possible suggestion of cancer, we could, in ten years, reduce the mortality to but a fraction of its present rate.

It may not be amiss here to say something concerning the danger which lies in attempts to avoid surgical treatment, our only known means of the cure of cancer, from a foolish fear of the knife. This fear is frequently encouraged and played on by "cancer cure" quacks for their personal gain. There still remains a very widespread popular belief that cancer may be cured by some internal medicine or local application. If everyone realized the fundamental fact that cancer cells cannot be killed except by being removed from the body or by the local application of physical agents such as x-ray, radium, and heat, which also kill the normal cells in the same vicinity, there would be no tampering with life, in futile attempts at cure, with agents of any sort the action of which cannot be definitely controlled locally.

It is, of course, possible that some specific vaccine or serum may be found which will so develop the resisting powers of the body that cancer cells will not grow, but such a possibility is highly improbable. In the meantime, the public should feel assured that the medical profession is early and fully aware of the possibilities of every new method of treatment for cancer proposed either publicly or under the guise of secrecy. And there are abundant opportunities in hospitals and research laboratories for everyone to try out any method from which there is a reasonable hope of benefit to the cancer patient. If the cancer patient fully realized this and refused to submit himself to the ministrations of the cancer cure quack, the long list of inoperable cancer cases which come to physicians and surgeons as they say "after having tried all kinds of medicine" would be greatly diminished and thousands of lives would be saved which are now a sacrifice to ignorance and unfounded fear.

BENZYL COMPOUNDS

The Council on Pharmacy and Chemistry reports on the therapeutic status of benzyl compounds. It was shown a few years ago that the papaverine group of opium alkaloids caused relaxation and inhibition of smooth muscle fibre and it was suggested that this action was dependent on the benzyl grouping in the papaverine molecule. This suggested that possibly the same action might be secured from simpler benzyl compounds, and a number of benzyl esters were investigated. Soon the use of benzyl esters in medicine gained considerable vogue. They have been recommended in hypertension, asthma, angina, dysmenorrhea, biliary and renal colic and similar disorders. The Council finds that extensive clinical use does not confirm

the enthusiastic estimate of the early advocates. An inquiry addressed to a number of clinicians disclosed an almost unanimous opinion against the value of these preparations so far as most of the recommended uses are concerned. None had seen any action whatsoever in hypertension, nor had the blood pressure been lowered. None of the consultants had seen any effects from the use of benzyl esters in asthma, or in renal or biliary colic. Benzyl esters had apparently given relief in a certain number of cases of dysmenorrhea. A small percentage of patients with angina pectoris appeared to have been benefited by their use; also, a few cases of intestinal colic, which might be explained by a carminative action. (*Journal A. M. A., Dec. 6, 1924, p. 1864.*)

TUBERCULOSIS IN INFANCY*

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It is the purpose of this paper to present the views held today by pathologists and clinicians in Vienna regarding infantile tuberculosis. The etiology, course and prognosis of tuberculosis in infancy are of great importance from the points of view of therapy and prophylaxis. Vienna, the "Tuberculous city," offers innumerable opportunities for the study of this disease. The painstaking, thorough studies of this available material are a revelation to the American student. The ideas and principles emanating from such a source deserve our most critical attention and interest.

As is well known, tuberculosis was considered chiefly a disease of adult life until the establishment of the Pirquet reaction. Investigations by Pirquet, Hamburger, and others have shown that about 85 to 90 per cent of all children have been infected with tuberculosis by the time they attain puberty. Over night, this disease became one of the principal infections of infancy and childhood. Its recognition was one of the great advances in the field of pediatrics.

Gradually more careful statistics became available. Ghon, in his classical researches, showed that about 11 per cent of infants became infected during the first year of life. Hamburger and Sluka found that, in routine post-mortem material, 6 per cent are infected in the first trimester; 17 per cent in the second; 22 per cent during the third and fourth trimesters; 42 per cent during the second year of life and 59 per cent in the third and fourth years of life.

The frequency of infection coincides very closely with the activities of the baby and its association. During the first months of life its contact with the mother and nurse gives the infant little opportunity for the contraction of any infectious disease. As the baby learns to sit up, support itself, and walk about, its field of contact becomes wider and the chances of infection correspondingly greater.

THE MODE OF INFECTION

The mode of infection is of the utmost clinical importance. After years of investigation, we are beginning to understand more completely how the

primary infection takes place. The researches of Rietschel have shown that the occurrence of congenital tuberculosis is possible. However, this source of infection is very rare and of slight importance. The patient usually dies during the first few months of life.

The vast majority of cases of tuberculosis are acquired. For many years the mode of entrance of the bacteria was a matter of dispute. With more abundant material and more careful technique we are reaching the conclusion that an extra-uterine, pulmonic infection plays the leading rôle in human tuberculosis.

Ghon and Winternitz have recently reported their analysis of 608 cases of tuberculosis found on the autopsy table. They were able to find anatomical evidence of primary infection in only one case. An analysis of their remaining cases showed that 15 had unmistakable evidence of a primary extra-pulmonic infection. Eleven of these were apparently primary intestinal tuberculosis. Five hundred sixty-seven cases showed definite evidence of a primary pulmonic infection. In fifteen other cases the pathological findings pointed to a primary intestinal or pulmonary infection. Eight cases involved the lung, intestine and head. One case involved the head and intestinal tract only. Ghon thinks that in those cases in which the pathological findings point with equal force to two sources of infection, the pulmonary mode should be preferred. Based upon these studies, he finds that 97.3 per cent of his cases showed a pulmonary infection and 2.7 per cent an extra-pulmonary infection.

Tuberculosis without lung involvement is exceedingly rare. Ghon, in his large series of cases, records only four instances. I had the opportunity of studying a case in Erdheim's clinic where the primary focus was located in the tympanic cavity. The infant, three months old, showed a marked swelling of the post-auricular nodes of the right side. The autopsy demonstrated that these nodes were caseous, with some calcification. A primary infection was definitely established in the right tympanic cavity. The nodes at the bifurcation of the trachea, and the lungs were entirely free of infection. In order to explain the course of events we must assume a tuberculous mother, an infected placenta, amniotic fluid containing tubercle bacilli, aspiration of this fluid into the middle ear and finally the infection of the mucous membrane with the tubercle bacillus.

*Read before the Consulting Medical Staff of the Lymanhurst School for Tuberculous Children, Oct. 28, 1924.

It is an equally unusual course of events that produces other cases of primary extra-pulmonic tuberculous infection. It is important clinically to recognize the enormous percentage of air-borne cases. It is vital from a prophylactic standpoint to take this fact for granted.

CLINICAL COURSE

The newborn infant may become infected with the first breath of air during the first day of life. The primary focus is, however, never localized in the apex, but is usually found in one of the lower lobes. Most commonly, the right lobe is involved, because the right bronchus is straighter and allows the inhaled tubercle bacilli direct access to the right lower lobe. This primary focus is a caseous pneumonia which very often becomes rapidly encapsulated. From the primary focus through the lymphogenous route the regionary lymph nodes in the hilus become involved. This picture is so characteristic that in a post-mortem examination of a child one should examine, first, the tracheobronchial lymph nodes and then the lungs. Three courses may now occur:

1. The primary focus and the infection of the lymph nodes can heal completely and the child continue its existence without any further clinical symptoms.

2. The worst prognosis is afforded in those cases in which the primary focus progresses in size, the lymph nodes in the hilus become greatly enlarged and one finally gets a cavity formation in the lung itself. A caseous miliary or lobular pneumonia can occur. A caseous lobar pneumonia is rare. The end result is always fatal.

3. Most commonly, however, the primary focus becomes encapsulated and the live bacteria remain in the lymph nodes. The child lives and develops. When it reaches puberty an apical infection sets in. In infancy there is no such thing as an apical infection.

An infant can not cough up its sputum. It is swallowed and may cause an intestinal tuberculosis. Intestinal tuberculosis is always alimentary, never hematogenous. The presence of a tuberculous ulcer in the intestinal wall, means an ulcerated focus in the lung. It is very common in infancy.

Enlarged caseous lymph nodes or tuberculous areas in the lung itself may involve neighboring blood vessels. Living tubercle bacilli then find their way into the blood stream. A miliary tuberculosis always results.

In general, then, we may say that tuberculosis in the human being spreads through four routes. The initial infection is erogenous; the hilus infection is lymphogenous; the intestinal infection is alimentary; and the generalized miliary infection is hematogenous.

The constitutional and nutritional condition of the infant apparently plays no part in the frequency of infection. They are important factors, however, in his recovery.

PROGNOSIS

The prognosis of a tuberculous infection in infancy has been subject to some dispute. It is apparent that an early infection is very serious. This is due to a deficiency in anti-body formation. The initial lesion advances rapidly by a contiguous process in the lung. Early caseation or a tuberculous pneumonia with a resulting cavity formation is a common finding. Efforts at healing on the part of the organism are necessarily slow and, for the most part, ineffectual. An early generalization of the tuberculous process is almost characteristic of tuberculosis in infancy.

A short time ago, a hopeless prognosis was given in every case. During recent years, a more favorable stand is gradually being taken by pediatricians.

Lederer reports three striking cases from his clinic in Vienna. The patients were four and a half, ten and eleven months of age respectively, and showed clinical and x-ray findings of a pulmonary infection. The tubercle bacilli were demonstrated. Under careful therapeutic regime, these patients have lived for two years and show at present no evidence of an active infection.

Oswald has reported his studies on 135 cases of infant tuberculosis. His total mortality was 65.5 per cent. During the first year of life his statistics showed a mortality of 86.5 per cent; during the second year 10.8 per cent; and during the third year only 2.7 per cent. His prognosis is absolutely fatal in infants under six months of age and becomes rapidly better with the advancing age of the patient.

Hahlo has corroborated Oswald's findings. In a study of forty cases, her total mortality was 75 per cent. Her mortality in infants infected in the first six months of life was 100 per cent. Those infected between the seventh and the fifteenth month showed a mortality of 73 per cent. The prognosis

in cases showing only a positive Pirquet reaction without clinical symptoms was especially good. Scrofula, skin and bone tuberculosis showed a mortality of only 29 per cent.

THERAPY

Therapeutically our only hope lies in a rigid prophylaxis. The newborn infant of a tuberculous mother should be removed immediately after birth. It must be reared in non-tuberculous surroundings. After the second year it may be returned to its mother with much less danger of a fatal outcome. It is realized that the remedy is radical and difficult to accomplish in actual practice. An intelligent co-operation and understanding on the part of the parents is absolutely essential. It is important that they realize the significance of an early infection. With the closest co-operation between physician and parent, prevention of an early infection is assured. This would eliminate another important factor in our infant mortality rate.

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CHLORIN IN RESPIRATORY DISEASES

In New York two clinics were established by the Health Commissioner to determine the efficiency of chlorin inhalations in the treatment of respiratory diseases. These clinics began active work June 1. They continued in operation until August 1, when they were closed because the results were considered unsatisfactory. It is reported that only 6.5 per cent of 506 persons with various respiratory diseases reported themselves as cured. Fifty-three per cent of the patients reported improvement, but the physicians in charge do not attach much importance to such reports since it is well known that patients with minor respiratory infections tend to improve by the very nature of their disease. It is evident that the physician who uses the chlorin treatment in his practice must do so with the distinct understanding that he is using an unestablished method. (*Journal A. M. A., Dec. 6, 1924, p. 1851.*)

OSTEOMYELITIS IN CHILDREN*

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The relative infrequency of acute osteomyelitis in children is largely the cause in my opinion of the many mistakes of early diagnosis. There should be no reason to attribute the local condition to sprains, fractures or dislocations even with the history of trauma, since the systemic and local conditions point clearly to infection. Perhaps to avoid error and delay it is necessary to regard as osteomyelitis all acute febrile cases, especially in children who have pain and inflammatory changes in the region of the epiphysis. (Pfeiffer.²)

Osteomyelitis is essentially a disease of childhood, but there are two distinct types of osteomyelitis, juvenile and adult. The first is metaphyseal while the second may occur anywhere in the bone. (Gibson.¹)

It is the object of this paper to show especially the pathology which takes place in the bone in acute cases of childhood with such regularity that it may almost be regarded as the rule in acute bone infections of children. The real difference as to the changes or amount of bone destruction depends largely upon the type and virulence of the infection, and slightly upon the condition and anatomical shape of the bone involved. That is, we may have bone infection or destruction without external suppuration as seen in Guerre's disease or Brodie's abscess, or we may have decided change with profuse suppuration.

The causative factors in acute bone infection are *Staphylococcus aureus*, *Staphylococcus albus*, *streptococcus*, *pneumococcus* and occasionally bacillus infection, as the typhoid bacillus. It is obvious that the infection is hematogenous and many conditions, as pustular skin infections, influenza, oral infection, bronchitis, throat infections, may precede the process. Previous illness, exposure, malnutrition and rickets may be predisposing factors.

Infection of bone through incision of bone and surrounding tissue is relatively rare in children, while the opposite is quite true in adults, but in both cases there is a tendency for the condition to be quite localized. Trauma may, through destruction or injury of spongy portions, break down the

*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, October, 1924.

internal architecture and destroy or interfere with blood supply, making a lodging place for bacteria and indirectly being the exciting cause of the disease.



Fig. 1. Drawing showing how infection may become localized, destroy small portion of bone, become a cavity walled off by a definite membrane and become sterile. (Localized abscess.)

Pathology.—Lexer has shown by means of roentgen rays taken of bones in which the nutrient blood vessel had been injected with opaque substance, that there is a rich blood supply adjacent to the epiphyseal cartilages, most of which does not come from the nutrient artery but from vessels which encircle the growing end of the bone and send branches of considerable size direct to the epiphyseal plate and adjacent medulla. These branches break up into numerous wide capillaries in which the blood current is slowed and opportunity is given for the interchange of metabolic substances upon which the growth of bone depends. Nussbaum³ has demonstrated that these terminal arteries in the metaphysis admit emboli over twenty microns in diameter. This may explain why apparently large masses of bacteria can find lodgment in ends of bones and start infection while they are kept out of arteries elsewhere in the bone. Smaller emboli are washed along, as the arteries are not terminal in either epiphysis or diaphysis.

From Larig's work we have come to accept certain growth coefficients for the various bones of the human skeleton which represent the relative ratio of growth of bones of various epiphyses. The bones possessing the highest growth coefficients are the femur and tibia, and these bones are most fre-

quently affected by osteomyelitis; and even the ends of these bones most frequently affected as shown by Klemm are the ends possessing the most actively growing metaphysis.

After the examination of numerous x-ray plates of untreated acute bone infections in children, one can but notice the striking similarity of the infectious process in its beginning as to the manner of its progress and destruction of surrounding tissues. Practically without exception the bone in or near the epiphyseal line is involved because of reasons already stated, and for mechanical reasons because of the anatomical construction of the bone and its blood supply.

Certain changes will take place depending somewhat on the kind and virulence of the infection. Great or small amounts of bone will be destroyed due to interference of circulation, edema, and ac-



Fig. 2. Drawing showing general involvement of bone without any attempt of localizing, without producing pus, but destructive to large areas of bone. (Guerre's disease.)

tivity of bacterial products which will necrose and destroy bone. The various changes depending upon causes already explained are as follows:

1. The infection may become localized, destroy small portion of bone, become a cavity walled off by a definite membrane and become sterile (localized abscess).
2. There may be a general involvement of bone without any attempt of localizing, without producing pus, but destructive to large areas of bone (Guerre's disease).
3. Involvement with formation of an abscess

and discharge through the epiphyseal line (suppurative epiphysitis, so-called).

4. An abscess may form and involve the entire medullary canal with or without the discharge of pus through some portion of bone.

5. An abscess may form and discharge under the periosteum or through the epiphysis into the joint.

6. A combination in severe cases may result in destruction of ends of bone extending the entire length of the medullary canal, under the periosteum and also into the joint.

Incised wounds, compound fractures and gunshot wound infections may spread by blood and lymph channels under periosteum and through bone, but in children usually tend to remain localized.



Fig. 3. Drawing showing involvement with formation of an abscess and discharge through the epiphyseal line. (Suppurative epiphysitis.)

The diagnosis of acute bone infections.—The clinical symptoms of acute bone infections vary greatly. Pain in bone or near site of bone infection is quite constant and such complaint should not be overlooked on physical examination. The general symptoms of sepsis, chills, sweats, fever, headache, prostration, vomiting, rapid pulse and laboratory findings of a high leukocytosis, accompany the severe case. Local symptoms of pain, swelling, redness and effusion of neighboring joints is constant as the disease progresses. In late cases a local fluctuating abscess may be present. Deep bone percussion is valuable in the early diagnosis. Early high leukocytosis is constant. Blood culture

and x-ray findings come too late to be of value in the aid of early treatment of the acute case. In later stages in the neglected cases if the child does not die of sepsis we find large abscesses breaking



Fig. 4. Drawing illustrating how an abscess may form and involve the entire medullary canal with or without the discharge of pus through some portion of bone.

down, formation of sequestra and often involvement of joints, and deformities of extremities due to contracture of tissue.

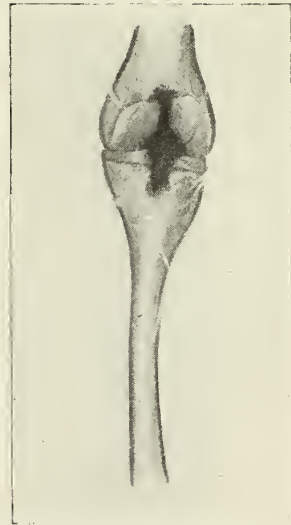


Fig. 5. Drawing showing how an abscess may form and discharge under the periosteum or through the epiphysis into the joint.

Treatment of acute osteomyelitis in children.—Description of the usual pathologic process that takes place in osteomyelitis in children is necessary to complete the essential methods of treatment.

We are agreed that osteomyelitis in children is a disease of the diaphysis of the bone with bone destruction beginning in or near the epiphyseal line. To prevent destruction of the bone, early drainage of the affected part is essential. Upon the first indication of tenderness, redness, swelling, pain upon pressure or pain upon percussion of bone, free drainage should be established. Several incised wounds through the outer tissue and periosteum should be made, then either a portion of the cortex one inch square removed down to the medulla, or, with a large bone drill one-half inch in diameter, the medullary canal exposed. Drainage wounds are always apt to be too small rather than too large and may be placed so as no serious deformity or blemish results. If pus is found, usually gauze or other drainage is not necessary except to keep the flesh wound open; but if no pus is found the cavity may be lightly packed with



Fig. 6. Drawing showing circulation of bone.

sterile gauze and usually within twenty-four hours pus will be found discharging from some of the various openings. Moist dressings, hypochlorite,

normal saline or boracic acid may be used as aids to drainage, but discontinued upon any signs of masceration of the skin. A small catheter may be introduced in the opening and Dakin's method used or tidal wave irrigation with various antiseptic



Fig. 7. X-ray showing infection beginning in or near the epiphyseal line and becoming localized.

fluids introduced, but hospitalization is necessary for success in this type of treatment.

In cases which have progressed so the shaft is involved the ends and shaft should be treated in this manner and in our experience in cases forty-eight hours old, in severe grades of infection extension to the shaft has taken place. It has been our experience in many cases that were treated early in this manner to have in a few days all signs of infection subside and in a few weeks to have the various open wounds close and the process become arrested without further bone involvement.

We are seldom able to see acute bone infections early enough to secure ideal results, and treatment of the sub-acute cases with bone destruction are those with which we most frequently deal. After the acute infective stage has passed, evidenced by absence of pain, temperature and leukocyte count, the various discharging sinuses should be kept clean and dry until such time that there is evidence of sequestra formation. This period may be from a few weeks to several months. Upon the evidence of definite formation of sequestra by probe and radiograph examination, radical operation should be considered and should include:

1. Removal of all sequestra.
2. Destruction of cysts and abscesses.

3. Complete drainage.
4. Removal of all possible eburnated involucrum, with poor blood supply.
5. Removal of all protuberances, destruction of depressions or craters so they may be easily covered with soft tissues.
6. Careful stripping and saving of periosteum.
7. Filling of unobliterated cavities with soft tissue.

Prevention of deformity through the use of apparatus is absolutely essential in acute, sub-acute and chronic stages; also after operation when considerable bone has been removed. The non-suppurative types of bone infection often result in bad deformities and should be especially watched and early weight-bearing prevented. Traction should be used in all infected joint cases, especially in the hip, to prevent deformity, dislocation, absorption and to relieve pain and muscle spasm. Walking apparatus is essential in marked involvement either through infection or operation with great loss of substance of bones of lower extremities to prevent deformity.

Interference with growth of extremities.—It is extremely strange why growth of bone is not more frequently interfered with in violent infections; but through the understanding of the bone pathology

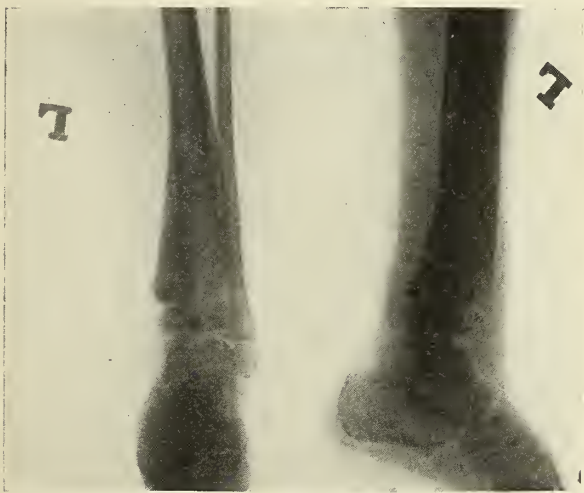


Fig. 8. X-ray showing infection beginning in or near the epiphyseal line, destroying portion of the bone and discharging under the periosteum.

we see that in the greatest number of cases the epiphysis escapes. Through irritation of the epiphysis we have seen the lower limb increase in length as much as three inches with scarcely appar-

ent deformity. Destruction of the epiphysis always results in diminished growth of bone and frequently results in serious deformity and disability. In a young child with proved destruction of grow-



Fig. 9. X-ray showing infection beginning in or near the epiphyseal line involving the entire shaft and discharging under the periosteum.

ing powers of epiphysis, it would be well to destroy the corresponding epiphysis in the well bone to prevent deformity.

CONCLUSIONS

Acute infective osteomyelitis is essentially a disease of childhood and adolescence.

It is absolutely a surgical condition.

The power of bone regeneration in children is almost marvelous.

Early and correct diagnosis for ideal treatment is essential.

Early wide-open complete drainage near the end of the bone is the successful method of treatment.

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DISCUSSION

DR. M. H. TIBBETTS, Duluth: Dr. Chatterton has pointed out the relative infrequency of acute osteomyelitis in children. It seems to me that its relative infrequency in children might be explained to a certain extent. I think it occurs more often than we really diagnose it on account of some difficulty in its diagnosis. Oftentimes the difficulty is due to the profound prostration which the child may have at the start of the disease. The disease is not only a local affair but there is a constitutional reaction which

sometimes overshadows the local osteomyelitis at its place of inception. This is often seen in the type of osteomyelitis that has been so frequently diagnosed as acute epiphysitis, in which one gets high temperature and great prostration. I remember calling to see a child who had a temperature of 104. She was extremely prostrated and



Fig. 10. X-ray showing infection beginning in or near the epiphyseal line destroying the shaft and epiphysis and breaking into the joint.

had a very bad looking throat, and the local sign had been overlooked entirely. The thought was that it was a general systemic infection with profound prostration, but on general examination it was found that one hip was extremely lacking in motion, and so our attention was drawn to that. On account of the limitation of motion of the hip, it was decided, in view of the fact that the temperature was so high and prostration so great, that there might be an osteomyelitis in or near the epiphysis. The child was

anesthetized, an incision made, and the neck of the femur exposed. The periosteum was incised and a good deal of pus discharged, so that it was an osteomyelitis in that region. The child promptly recovered after that.

Another thing that often confuses our diagnosis, or is often mistaken for a diagnosis, is tuberculosis. It seems as though that should not be, but I have several times been confronted with cases that had been diagnosed as tuberculosis of the knee, and the child on examination had several sinuses in that leg and some in the other leg, also. I recall one particular case that was brought to my attention as tuberculosis of the knee. Going into the history, I found that the child became acutely ill and soon after that a swelling of the knee and discharge of pus followed. Tuberculosis never starts that way. Tuberculosis of a joint does not come on acutely. This child had an extreme rise of temperature at the time of onset. Tuberculosis of the joint does not start that way. The temperature that you get in tuberculosis is low and intermittent and comes on insidiously.

The next point that I would like to bring up in regard to Dr. Chatterton's paper is what rôle slight trauma plays in the development of acute osteomyelitis. I know as far as the treatment and diagnosis are concerned it has very little significance, but when we come to medicolegal affairs the importance of slight trauma with osteomyelitis developing afterward has to be taken into account. Ely in his recent book, "Inflammation of Bones and Joints," says that the etiological factor of slight trauma has absolutely nothing to do with it; that when we consider the structure of the bone with the hard outer surface and the marrow in the inside, it does not stand to reason that a slight trauma on the outside should have any etiological significance. However, when we consider the fact that some marrow extends into the Haversian canals along with the blood vessels and that a relatively small trauma may block one of these and thus form a lodging place for bacteria that may be in the body, it seems to me this should bear some weight in legal cases.

The Therapeutic Use of Digitalis.—The Council on Pharmacy and Chemistry has long held that digitalis effects can be obtained satisfactorily in most instances by the oral administration of digitalis itself, the tincture or the infusion, and that the intravenous administration of digitalis preparations is rarely necessary. However, investigation indicates that digitalis preparations are administered intravenously far more frequently than seems to be demanded. Because of the importance of digitalis therapy, the Council decided to appoint a committee composed of men who have made a study of questions concerning the administration of digitalis, and to request this committee to prepare a report for publication, which would set forth concisely the limitations of digitalis therapy and the methods of obtaining digitalis effects. At the request of the Council, Drs. G. Canby Robinson, Paul D. White, Cary Eggleston and Robert

A. Hatcher prepared a report. This report brings out the indications for the use of digitalis, the limitations of the drug, its dosage and method of administration. It discusses at considerable length the conditions where the intravenous and intramuscular administration of digitalis may be called for and when the oral administration will be found satisfactory. The report concludes with the statement that the oral administration of digitalis in the form of the standardized powdered leaf, infusion or tincture, meets every requirement of digitalis therapy, with the exception of those relatively infrequent cases in which immediate relief is imperatively demanded, or when nausea or vomiting precludes the oral method, and outlines the intravenous, intramuscular or rectal administration of digitalis bodies when the threatening condition of the patient demands immediate relief. (Jour. A. M. A., Aug. 16, 1924, p. 504.)

ARTHROPLASTY*

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The abolishment of motion in an ankylosed joint may be complete, the bony components of the joint being welded into one solid mass and forming bony or true ankylosis, or in cases of false or fibrous ankylosis, there may be slight motion. The question, can mobility be brought about in these ankylosed joints, may be answered in the affirmative. This does not mean, however, that every ankylosed joint may be made to move, nor does it mean that it is desirable to attempt to mobilize every stiff joint. Often function, so far as the patient himself is concerned, is so good that the cost of mobilization, computed in terms of time, pain, discomfort, and so forth, is too great to pay for a result that may be more or less uncertain.

The term "ankylosis" is sometimes erroneously applied to stiff, painful shoulders, sometimes called "glass arm" or "pitcher's arm," to stiff knees following fixation in a plaster cast or splint for fracture of the femur, and to knees with marked limitation of motion following a low-grade arthritis in which there has been no actual erosion of cartilage. The group of cases, however, that form the basis of this paper are not of this type, but are of true bony ankylosis, or fibrous ankylosis, which, so far as function is concerned, is quite as disabling. The few patients with the fibrous type of ankylosis, who were subjected to arthroplasty, had previously been treated by physiotherapeutic measures, or brisement forcé, without benefit. During the last fourteen years, we have performed a few arthroplasties each year in cases that seemed suitable. During these years, certain points have been learned with regard to the joints best suited for arthroplasty, the type of stiff or ankylosed joints that lend themselves best to this plastic operation, the type of person best suited to carry on persistently and faithfully the sometimes painful after-treatment, the best operative technic for each of the different joints, and certain aids in the postoperative and after-care. However, we are performing arthroplasty on only a small percentage of the stiff joints that we see.

Arthroplasty is a plastic operation on an anky-

losed joint to permit motion with stability. The old-time excisions of the elbow, shoulder and hip permitted motion, but rarely afforded stability, although the results were often very satisfactory to the patient. Excision of varying amounts of bone is the fundamental principle of all arthroplasty. Nevertheless, strictly speaking, an excision or arthrectomy, even though done to obtain motion where an ankylosed joint previously existed, is not an arthroplasty. An arthroplasty is a refined arthrectomy, carefully planned and carried out, just enough bone being excised to give motion, and the bone ends being remodeled to afford stability.

At the sixth meeting of the International Society of Surgery, held in London in July, 1923, the subject of arthroplasty was discussed. Hey Groves, in his introduction, said that in its broadest sense,

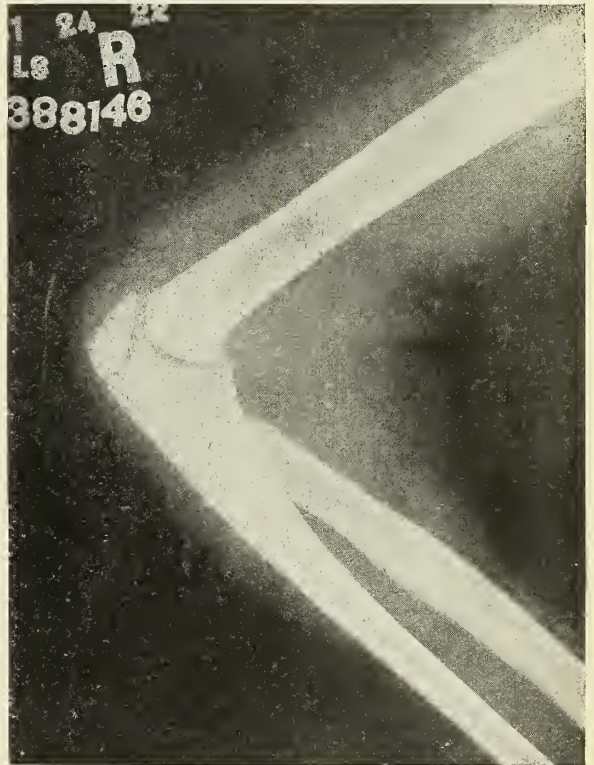


Fig. 1. After arthroplasty for bony ankylosis. Excision of head of radius and remodeling by splitting of olecranon process. Beef bone screw used to reunite olecranon.

arthroplasty may be taken as meaning the operative mobilization of any stiff joint, and will thus include those types of excision which aim at restoring mobility. In America, the term is more restricted. Certainly, if by a "refined" excision, one can get motion with greater stability, let us term

*Read before the Minnesota State Medical Association, St. Cloud, October 8 to 10, 1924.

such operation arthroplastic in contra-distinction to the simpler and more easily executed excisions. The late J. B. Murphy, with characteristic force and optimism, attacked the problem of ankylosed joints.



Fig. 2. Extension after arthroplasty.

He obtained some excellent results from arthroplasty and advocated the operation, knowing that as the experience of different surgeons increased, better results would be obtained. That his enthusiasm was warranted is known by the work of Putti in Italy, and Campbell, Baer and MacAusland in this country.

JOINTS SUITABLE FOR ARTHROPLASTY

The jaw, elbow, knee and hip, in the order named, seem the most suitable for arthroplasty. Good results have been obtained in the shoulder joint, but the cases are too few to permit a definite opinion. Also, the motion of the scapula on the thorax compensates so greatly for the lost motion that the need for the operation is not so imperative as in other joints. The knee would not have been considered more suitable than the hip a year ago, but certain rather excellent results obtained recently have led us to reconsider this point. It must be remembered that arthroplasty is, to a certain extent, still in the developmental stage, and what is apparently true today may not be true tomorrow. After arthroplasty of the hip, the remodeled head of the femur often appears to wear away on use, and insecurity results. Opportunities for observing these cases many years after operation have thus

far been rather limited, and it may be found on further experience that this wearing away does not, after all, occur so frequently.

COÖPERATION OF THE PATIENT

It is extremely important that the patient be enthusiastic and eager for the attempt to produce motion in the stiff joint, and that he have the courage and the staying qualities to carry through the after-treatment. In no other type of surgery is the hearty coöperation of the patient so important in obtaining a successful result. He must be persistent and faithful in the effort to bring about motion, bringing into play muscles that have had no function to perform for years. Physiotherapy must be carried on for many months. There often comes a critical point during the convalescence when the joint tends to stiffen, and if movement is not forced thoroughly to the point of tolerance,



Fig. 3. Flexion after arthroplasty.

motion will be lost. Children are, as a rule, poor subjects for arthroplasty. They do not, of course, appreciate the necessity of the persistent after-treatment, and do not tolerate the soreness incident to forcing motion.

TYPE OF JOINT

Of even more importance than the selection of a patient who will "carry on" after operation is the proper selection of the type of stiff joint. Bony ankylosis following the acute infections, in cases

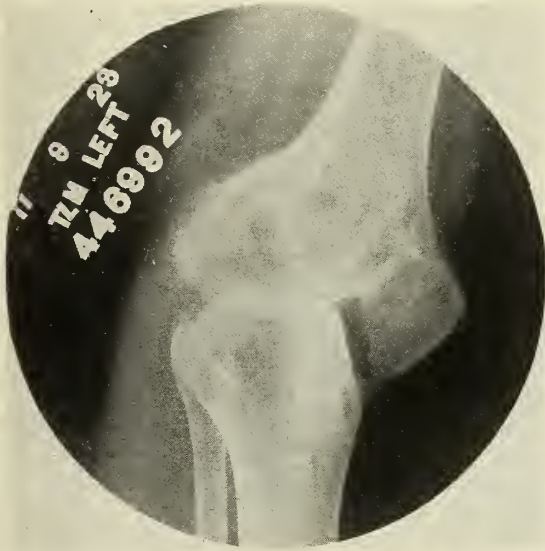


Fig. 4. Bony ankylosis of patella to femur and femur to tibia.

in which all pain, tenderness, thickness and local heat have been absent for at least a year, is the best field for arthroplasty. The danger signals are pain, tenderness, thickening and local heat, and these must be heeded. Fibrous or false ankylosis, under like conditions, probably gives as good results, but in such cases it is more difficult to tell when the zero point in the infection has been reached. It is plainly impossible to appoint a definite time for attempting surgery. I am convinced that most of our poor results were due to operating before the infection was quiescent in the joint itself, or while a generalized arthritis was still active in other joints. Arthroplasty should not be performed until all signs indicate that the process has been quiescent for one year. The same holds true for the post-traumatic joint, a good example being the stiff, painful, almost completely ankylosed elbow that occasionally follows a dislocation with fracture. The callous-forming proclivities of such joints are very great. Before interference, the "green" stage of the callus must have passed, and the mature stage be well established. It is not unusual to wait from eighteen months to three years before such joints are ready for operation. Arthroplasty done in the "green" stage of the callus is doomed to

failure. In spite of the fact that some satisfactory results have been obtained, I believe it is better not to attempt the operation on an ankylosis due to tuberculosis, particularly of the hip, as the tuberculosis will flare into activity in a high percentage of cases. Aside from tuberculosis, the type of infection in monarticular ankylosis is unimportant. Gonorrheal ankylosis has been condemned by some as unsuitable for arthroplasty, but it has been my experience in comparatively few cases that if there is no activity and the ankylosis is complete, the results are entirely satisfactory. Gonorrheal arthritis that does not become purulent is sometimes slow to subside, and the quiescent stage is slower in developing than in the septic processes. Consequently, the surgeon may judge from the time elapsed that it is safe to operate, and be disappointed. Although we cannot make definite rules,



Fig. 5. Voluntary flexion after arthroplasty.

the following points warrant emphasis: (1) avoid the tender, painful, thickened, warm ankylosed joint, whether following sepsis or trauma; (2) avoid the case in which there is multiple joint in-

volvement, if the process is still active in other joints, and (3) avoid tuberculous ankylosed joints. The patient with ankylosis in both knees is entitled to arthroplasty, other things being equal, as is the



Fig. 6. Voluntary extension after arthroplasty.

patient with two stiff hips alone, or with two stiff knees also.

OCCUPATIONAL AND ECONOMIC STATUS

If the ankylosed joint is in a suitable position for ordinary uses, and does not interfere seriously with the patient's occupation, surgery should be undertaken only after the most careful consideration, in which the possibilities are placed fairly before the patient. Many patients with ankylosed, but useful limbs, who come to the Mayo Clinic determined to have a joint made movable, lose their enthusiasm when they reckon carefully the time that will be required, and the loss of income during that period. When the ankylosis is in a position which renders function awkward or impossible, the operation may be more readily urged. We must be certain, so far as we can, that the mobility gained will give better service to the patient than would the stiff limb. Many factors enter into making a decision, and each case demands individual consideration. A frank discussion between the patient and the surgeon, based on the latter's experience, and that of other surgeons experienced in the operation, is the basis on which the question of the advisability of arthroplasty must be decided.

GENERAL PRINCIPLES OF OPERATIVE TECHNIC

The object of an arthroplasty is to give the patient a movable joint with stability. Motion can only be obtained by excision of bone. Some means

must be taken to prevent the growing together of the bone ends, for the raw surfaces will join readily if left in contact. To prevent union, pedicle flaps, free autogenous fascial coverings of fascia lata, or prepared animal membranes, such as Baer's chromicized pig's bladder, are used according to the preference of the surgeon. In the jaw it is unnecessary to interpose any substance, although this is carefully done by some surgeons. It is sometimes stated that the interposition of a substance between the bone ends is not necessary in any arthroplasty, one of the chief arguments being that the results of excision of the jaw are comparable to the most carefully planned and executed arthroplasty. The anatomic structure and the manner in which the jaw functions, however, change the requirements to a certain extent. In the hip, elbow and knee, interposition of a substance is essential. Occasionally, it is argued that a splendid false joint may occur in the shaft of the humerus, femur, and so forth, when nonunion exists. Here it may well be that the underlying cause of the nonunion was the interposition of a piece of muscle or fascia. False joints do not occur in the spongy bone in the region of the joints, for here it would be difficult for a muscle flap to be interposed, and nonunion is rarely, if ever, seen.

Detailed descriptions of the types of arthroplasty cannot be given here. Campbell, Baer, Putti and MacAusland have given excellent descriptions of their technic.

The operation on the jaw, described in 1918 by New and myself is still used in the Clinic, except that New now uses more care in shaping the neck of the ramus like the normal contour of the head. No fascia or tissue of any sort is interposed. In operating on the elbow, the MacAusland technic is now used. Campbell does not split the olecranon, and avoids the necessity of taking fascia lata from the thigh by using a pedicle flap. We have obtained good results by both methods. The splitting of the olecranon gives a most desirable exposure, and by using a beef bone screw to bring the fragments together on closure, early mobilization is obtained.

Recently we have operated on the hip through the Smith-Peterson incision, turning down the muscles from the iliac bone. The old U-shaped incision, advocated by Murphy, with the chiseling off of the top of the trochanter with its attached muscles, and traction upwards, also affords excellent

exposure. Here again the question of a pedicle flap or a free flap comes up; either may be used. It is difficult to get a pedicle flap that will cover the entire head, but it is easily accomplished with a fascia lata transplant.

We used to use the pedicle flap in operating on the knee, but it is difficult to obtain a flap of the proper size, whereas fascia lata is readily obtained in ample size. The technic of Putti has been adhered to closely; both condyles are remodeled after turning down the patella by cutting through the quadriceps tendon. Campbell has shown that our

parts quiescent until the blood clot is sufficiently organized to prevent bleeding on motion. Motion should be begun early, usually in about five to seven days, and when it is begun, splints or some apparatus must be used to prevent displacement. Motion must not be forced so as to cause severe pain and discomfort, or the patient will become fearful and discouraged, and his full coöperation be lost. In the weight-bearing joints, the knee and the hip, our results have been definitely better since the postoperative fixation was so arranged that continual traction could be maintained. The splint designed by Jepson has been useful for both the knee and the hip. When the patient reaches the ambulatory stage, a jointed brace at the knee is necessary to prevent lateral strain. There may come a time, about six to nine weeks after operation, when the patient can gain no more motion, is discouraged, and is not making the persistent effort which is essential. Often by anesthetizing the patient, putting the new joint through a full range of motion, and loosening up adhesions, much will be accomplished. The patient can be told that there is good motion present, and this assurance will lead to increased efforts on his part.

REVIEW OF CASES

The group of 142 cases in this series were treated since 1910. In forty-eight arthroplasty of the elbow was performed, in forty-one of the jaw, in thirty-two of the hip, in eighteen of the knee, and in three of the shoulder. As so often happens in a comparatively small series of cases, collected over a period covering a number of years, accurate and detailed postoperative notes are not available in all instances, and when the time comes for a study of the group, memory is not to be relied on. Of the total number, however, definite information was obtained concerning 103, while the records in thirty-nine were so untrustworthy as to make it necessary to chart the results as unknown. There were no deaths following operation. No postoperative shock was evident except in a few hip cases in which the patients were in rather poor condition, and the operation was difficult. Seven infections developed following operation in the 142 cases, six of them being in the hip, and one in the knee. I believe that most of these were due to a lighting up of an old infection rather than to a break in the technic. In the hip, the joint and periarticular structures are so deeply placed that tenderness can-

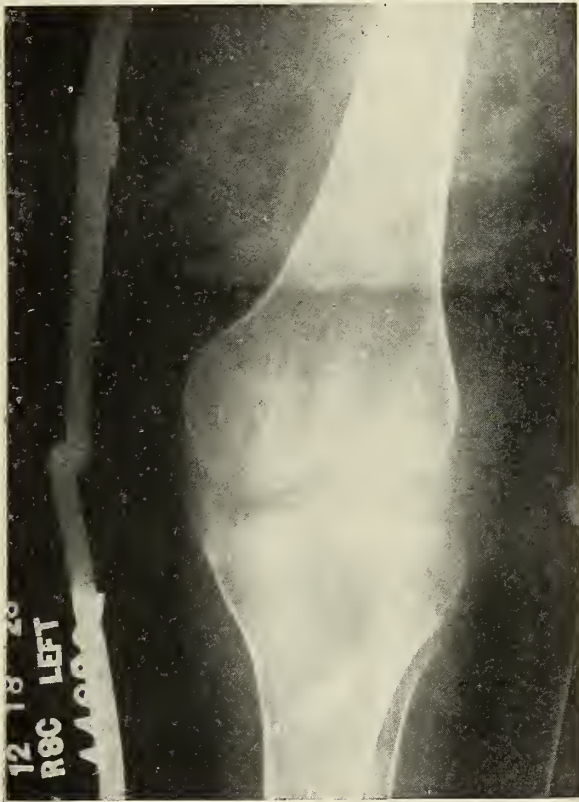


Fig. 7. Remodeling of joint surfaces with extension showing joint separation.

attempt to duplicate, as nearly as possible, the anatomic structure by modeling two condyles is not necessary. His excellent results followed the fashioning of one large condyle to fit in the prepared tibial head.

GENERAL PRINCIPLES OF POSTOPERATIVE TREATMENT

Postoperative treatment varies somewhat according to the joint. However, the following general plan may be laid down: Adequate fixation should be provided to prevent dislocation, and to keep the

not be readily elicited by palpation and so detected, as in the knee or elbow.

It is difficult to grade the results, but, for the sake of simplicity, they have been referred to as excellent, good, fair, and poor. For all practical purposes these terms are as definite as any. I wished to determine whether the operation of arthroplasty when performed in selected cases is satisfactory. Therefore, if such an operation on a patient with multiple ankylosis gives, so far as the joint itself is concerned, a good, painless range of motion, the result has been called good. The patient, however, might still be incapacitated, due to involvement of other joints. The age and sex varied somewhat according to the joint involved. Most of the patients were in the third and fourth decades. There were seventy-four females, and sixty-eight males. The sex incidence according to joints was as follows: elbow, eighteen females and thirty males; jaw, twenty-four females and seventeen males; hip, sixteen females and sixteen males; knee, sixteen females and two males; shoulder, no females and three males. The etiology could not always be definitely established, but ninety-two cases were classified as infectious, four as gonorrheal, eleven as tuberculous, and twenty-one as traumatic. The results in the 103 cases were as follows: Forty (38 per cent) excellent; twenty-four (23 per cent) good; twenty (19 per cent) fair; and nineteen (18 per cent) poor. By grouping the excellent, good and fair results (all of these patients certainly were improved by the operation) it will be found that eighty-three (81 per cent) derived distinct benefit, and sixty-four (62 per cent) obtained excellent or good results. None of the patients was made worse. In the elbow (Figs. 1, 2 and 3), of thirty cases traced, the results were excellent in twelve (40 per cent), good in seven, fair in five, and poor in six. In the jaw, of thirty cases traced, the results were excellent in twenty (66 per cent), good in twelve, fair in fourteen, and poor in four. In the hip, of twenty-seven cases traced, the results were excellent in three (11 per cent), good in nine, fair in eight, and poor in seven. In the knee (Figs. 4, 5, 6 and 7), in thirteen cases traced the results were excellent in four (30 per cent), good in four, fair in three, and poor in two; in the shoulder, there was one excellent result and two good ones. With the improved technic of today, and with the greater experience in choosing patients and selecting the opportune time

for operation, I feel sure that our recent results are better than these figures indicate.

TABLE 1
RESULTS OF ARTHROPLASTY IN 103 OF 142 CASES

Joint	Excellent	Good	Fair	Poor	Total
Elbow	12	7	5	6	30
Jaw	20	2	4	4	30
Hip	3	9	8	7	27
Knee	4	4	3	2	13
Shoulder	1	2	0	0	3
	—	—	—	—	—
Total	40	24	20	19	103
Per cent	38	23	19	18	
Excellent and good in 64 (62 per cent)					
Satisfactory in 84 (81 per cent)					

SUMMARY

Arthroplasty is to be distinguished from arthrectomy in that the former, although a refined excision, has as its object not only the establishment of motion, but stability. Stability is not so important in the upper extremities, but it is extremely so in the lower extremities. The selection of cases is most important. The process which caused the ankylosis must be quiescent not only in the joint involved, but in every other joint. In the traumatic cases, the same holds true as regards the joint involved, and the callus must be matured. The patient must coöperate to the fullest extent and carry out the after-care determinedly. Such coöperation is seldom to be obtained from children. In all joints except the jaw, it is best to interpose some substance, preferably autogenous tissue, to prevent the recurrence of the ankylosis, and in the lower extremity, extension should be applied to separate the joint surfaces until the postoperative reaction has thoroughly subsided, and to permit of early passive motion. Infections developed in seven cases (5 per cent), but no deaths followed operation in this series.

CONCLUSIONS

1. Each case is considered separately, the joint or joints involved, the type of infection, the type of the patient and his economic status, all being prominent factors in the decision as to whether or not arthroplasty should be undertaken.
2. Since 81 per cent of the 103 patients traced obtained satisfactory motion in previously ankylosed joints, and since 64 per cent obtained good

or excellent results, arthroplasty would seem to be a justifiable procedure.

3. Failures to obtain good results from arthroplasty are mostly attributable to a poor selection of cases.

4. The cases in the series were observed during the last fourteen years. There is no doubt that with the present advances in technic and experience in the selection of cases, the percentage of excellent results could be increased.

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DISCUSSION

DR. EMIL S. GEIST, Minneapolis: Dr. Henderson is to be congratulated on the excellent results obtained. I think it is in large clinics like that of Rochester that operations of this type should be thoroughly tried out before being done by everybody. The list that Dr. Henderson showed on the last table I think represents the best series of results that I have seen so far. The attitude of a great many orthopedic surgeons is that of "watchful waiting." I looked up to see what Jones and Lovett had to say about arthroplasties. They published a book in 1923. They were still rather skeptical. They say, "Many cases operated upon by various surgeons have been examined by the authors, in the larger proportion of which the joint would have been more useful if it had been left alone." However, they were probably cases that were seen five or six or seven years ago and before the technic had been perfected. It is very hopeful to see the list as presented by Dr. Henderson today.

Simply because a person has a stiff joint does not mean that an arthroplasty is indicated. I had that forcibly brought home to me in my office a few days ago where in two adjoining rooms I had two patients, each with a stiff

knee joint. One was a workman, that is to say, he was an automobile salesman, with a stiff knee in a good position. It was stiff; he was walking on it comfortably and it wasn't bothering him, so in his case it seemed to me that he should be left alone. In the other room sat a woman, the wife of a very wealthy merchant who about a year before had been on a trip to New York and who had brought a little present in the shape of a gonococcus and she also had a stiff knee. It was a painless knee; it was somewhat deformed in the sense of flexion. She limped quite a bit and it bothered her a good deal in her society life. A movable knee that she could only use for an hour or two a day would be a boon to her. The operation has not been done yet.

By the way, as this list will have shown you, the weight bearing joints seem to react differently from those that have no weight bearing to do. The results in elbow and the jaw are excellent as Dr. Henderson pointed out, but when it comes to hips and knees the situation is not so simple and that is where we especially desire good results. These latter joints have been the *bêtes noires* up to now.

It is a wonderful thing to have the operation of arthroplasty to fall back upon. There are certain cases where it must be done. For instance, in the case of the poor individual with two stiff hips. If we can give that person one movable hip and leave one stiff hip or, as I call it, a sitting hip and a standing hip—in such cases of course arthroplasty is absolutely indicated.

DR. A. R. COLVIN (St. Paul): Dr. Henderson's results are excellent, and there is no question about the advisability of doing arthroplasties in suitable cases. Probably if one is at all in doubt about doing an arthroplasty, it should not be done.

I saw several months ago, a man with a splendid result in arthroplasty of the elbow. Yesterday he came for re-examination with a painful joint as the result of attempting to do some work. He had had a very useful stiff elbow. Knowing that he was a laboring man probably he would have been better off if his elbow had been left ankylosed.

In the case of working people, especially in the knee and elbow, a joint ankylosed at a proper angle is, perhaps, in the majority of cases, more useful than one made movable by an arthroplasty.

As Dr. Henderson has said, arthroplasty of the jaw or for that matter mere resection is very satisfactory. I have found the incision along the line of the zygoma working subperiosteally, quite sufficient and free from any danger to the facial nerve.

DR. M. S. HENDERSON, Rochester: I have nothing to add particularly but I would like to emphasize what both Dr. Colvin and Dr. Geist touched on, namely, that all stiff or ankylosed joints should not be subjected to arthroplasty. The majority of patients with stiff joints that I see are advised to leave them alone. Some patients are very keen to have the operation, but when they learn of the time they will have to put in, and the time that they will necessarily lose from their work, and when it is pointed out that they already have a useful limb, they will lose their enthusiasm and go home satisfied that they are pretty well off.

SOME PRACTICAL POINTS IN SURGERY OF THE THYROID*

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The purpose of this paper is to bring out some points in the surgery of the thyroid gland without making an attempt to cover such a vast, complex subject completely. In considering the surgical problems of the thyroid intelligently, a thorough understanding of the various disturbances must serve as a foundation. There is no branch in surgery where judgment based on accurate clinical examination and wide experience is more essential than in the division of thyroid surgery.

The diagnosis and treatment of the various forms of goiter are greatly simplified by the use of an orderly classification. Jackson, of Madison, Wisconsin, has broadened the classification of Plummer into the following classes:

1. The colloid goiter
2. The adenoma
 - a. with hyperthyroidism (toxic adenoma)
 - b. without hyperthyroidism (simple adenoma)
3. The exophthalmic goiter (Basedow's or Grave's disease)
4. Tuberculosis, malignancy, syphilis, thyroiditis, actinomycosis, etc.

The colloid goiter, the first class, is not surgical. The majority of the colloid goiters can be reduced by the administration of iodine or thyroid products and should not receive x-ray or radium treatment. Clinically they are symmetrically enlarged and feel soft and granular. Microscopically they show acini filled with colloid material and are lined with flattened epithelium. This type of goiter probably never occurs in persons over thirty-five years of age, but is common during adolescence, especially in girls, appearing either at or following puberty, and usually disappears before the age of twenty-five. The metabolic rate in this class is normal.

The adenomatous goiter, the second class, is a surgical condition. Still the adenomatous goiter should not be operated upon before the patient's growth is completed, for the following reasons: (1) because it seldom becomes toxic during adolescence; (2) because the thyroid gland is greatly

needed at this period; (3) because immature adenomata may be left to develop later. After body growth is complete, the adenomata may be removed whether they are toxic or not, and in fact should be on account of the danger that they may become toxic. X-ray and radium treatments are of no value. Adenomata occur most commonly in middle life, becoming prominent only when the colloid material subsides. The adenomata are irregular and nodular in conformation. Their consistency depends upon the degenerative process present. Those tumors of the fibrous and calcareous types are hard, while those of the colloid, cystic and hemorrhagic types are soft. Microscopic examination shows the adenomata to be encapsulated by normal thyroid tissue. The acini of the adenomata may be fetal or adult in type, and may contain large quantities of colloid material. Toxic adenomata show no hypertrophy or hyperplasia of the acinal epithelium.

Adenomas rarely cause symptoms of hyperthyroidism before the age of twenty-five, the average age at which toxicity appears being forty-three years. Jackson, of Madison, in a study of four thousand cases of goiter points out that one in every four adenomas becomes toxic before the patient reaches fifty years of age; that one in every five adenomas develops substernal projections; that five women have adenomatous thyroids to every man who has one; and that an adenoma is present on an average of sixteen years before the onset of toxic symptoms. Toxicity is due to degenerative products. At first the toxicity is mild, but it gradually increases. It exerts a selective action on the heart and blood vessels, causing such symptoms as an irregular pulse, attacks of tachycardia, hypertension and later myocardial degeneration, with dyspnea and edema. This degeneration is often permanent on account of the slow progressive hyperthyroidism. Tremor, moist and flushed skin, loss of weight and strength are noted the same as in exophthalmic goiter. The metabolic rate is increased, averaging about plus 38 per cent, but it does not reach the height of the rate of the exophthalmic goiter. After operation the metabolic rate of the formerly toxic goiter patient usually becomes normal. Moreover exophthalmos is absent and acute crises do not occur in the toxic adenomata. Thrills and bruit are rare.

The exophthalmic goiter, the third class, may occur at any period of life. It is most common in

*Read before the Minneapolis Surgical Society, Minneapolis, November 6, 1924.

youth, but has been found in children under ten years of age and in persons over sixty. The onset of the disease is acute. The Basedowian syndrome—tachycardia, flushed and moist skin, tremor, loss of weight and strength—appears early and progresses rapidly. Excessive appetite often accompanies these symptoms. Marked muscular weakness is characteristic, particularly manifested in the quadriceps group. In over 50 per cent of these cases of the third class, exophthalmos develops in the first few months and in over 90 per cent within the first two years. Exophthalmos is not always bilateral. It is the last of the cardinal symptoms to disappear. Exophthalmos frequently remains for a year or two longer on one side following successful treatment.

The pulse of the exophthalmic patient is rapid but regular until late myocardial degeneration occurs. Remissions and exacerbations are typical. Examination of the gland shows it to be symmetrically enlarged and quite hard on palpation. Microscopic examination of the exophthalmic goiter shows that the acinal epithelium is hypertrophied but that very little colloid is present. It is interesting to note that malignancy does not occur in exophthalmic goiter.

During the exacerbations, all the symptoms are intensified and gastro-intestinal crises occur. Fever is often present at this time. The pulse pressure is high with an extremely low diastolic pressure. The basal metabolic rate averages high—from plus 50 to plus 60 per cent. The metabolism test is a very helpful diagnostic aid and an excellent guide in estimating post-operative results.

The treatment, preparation and operation of exophthalmic goiter patients calls for the keenest judgment in those of widest experience. Plummer of Rochester has been the first to call attention to the importance of avoiding operation during periods of severe intoxication and of the necessity in dividing the treatment into operative stages. Operations done during gastric crises are nearly always fatal. Cases of this type should be treated medically by rest, circulatory stimulants, and bromides or opiates. We have within the past year used Lugol's solution, which has markedly reduced the toxicity as manifested by the pulse and the metabolic rate. On the other hand, Lugol's solution and ligation are not indicated in the treatment of toxic adenomata.

Dr. Gustav Schwyzer treats bad risks by single

ligation of one upper pole, using local anesthesia or gas. He considers this about three-fourths as severe as double ligation. With the usual improvement, the other side is ligated within a week. Following ligation of one or both upper horns frequently there is observed a marked improvement in a few days. In some cases it takes months. The pulse becomes slower, the purring bruit over the gland diminishes and the extreme nervousness disappears. Increase in body weight is a very important indication of improvement and a very favorable condition for the resection of the gland which is to follow.

In referring to the fourth group of Jackson's classification, namely, tuberculosis, malignancy, syphilis, thyroiditis, actinomycosis, I will not enter into the points of diagnosis. I will only call your attention to the fact that, as disturbances of the thyroid gland, they must be borne in mind in any diagnostic examination. Notwithstanding, many of the simple forms of goiter may often complicate operative procedure on account of the unusual location of the tumor in relation to the trachea. X-ray as well as laryngoscopic examinations assist materially in the diagnosis of irregularly situated goiters. In operating the circular, substernal and intrathoracic goiters one must be prepared for hemorrhage and suffocation associated with tracheal collapse. Right here it is well to mention that thyroid resection should never be attempted without having a tracheal cannula boiled with the other instruments. We have had occasion to use it a number of times.

The anesthesia to be used depends upon the operator and the nature of the thyroid disturbance. For the various kinds of simple goiter, as the adenoma, the colloid, the cystic, the cysto-colloid, local anesthesia properly administered has many advantages, such as, in operation upon the weak and aged, for preservation of the recurrent laryngeal nerve, elimination of post-operative nausea and vomiting, and decreasing the chance of post-operative aspiration pneumonia. In operating upon toxic thyroids, however, I believe that nitrous oxide anesthesia has distinct advantages, a very important advantage being the decrease in the time required, and a more important advantage being the decreased psychic disturbance to the patient. In the toxic type of goiter, when the operation is done under general anesthesia, we are often guided by the heart action of the patient during the opera-

tion. When the pulse rate of 120 to 160 comes down under general anesthesia to a rate of 100 it is often only possible at that time to decide whether it will be safe to continue with the ligation on the other side. Similarly the heart acts as a guide in resections of toxic thyroids. In sudden increase of the pulse rate it is often necessary to limit the resection to one lobe.

The technic of goiter surgery has become thoroughly standardized and without describing in detailed steps I will attempt to emphasize certain points that may be of interest but are not often found in print.

In the preparation of the skin, remember that the toxic thyroid is very susceptible to iodine burns and that manipulation—such as massage—of a toxic gland in the pre-operative preparation of the skin should be avoided because of the danger of increasing the absorption of toxins.

The operation for ligation is considered comparatively easy. Still, we have not always found it so. Speed is a very essential factor. The pulse is the best guide in deciding whether both sides should be ligated at one session. Where both upper poles are to be ligated, remember, in planning symmetrical incisions, that the left lobe is somewhat lower than the right. Incision in the skin crease opposite the cricoid cartilage proves to be about the right level. After exposing the upper pole, do not waste too much time isolating the superior thyroid artery. If it is found, we quickly pass a linen suture around it and ligate the artery separately. Whether it is found easily or not, we always pass an empty carrier around the entire pole. The carrier is threaded with a linen and a plain No. 2 catgut suture and the entire pole ligated. The catgut suture is always tightened first, because it permits of more tension, and then the linen is closed in the same groove. Polar ligation prevents a reversal of the circulation that may occur in the anastomotic branches with the inferior thyroid.

In thyroidectomies I wish to stress some of the points in the technic, such as the exposure of the gland, the control of the hemorrhage, the preservation of the recurrent laryngeal nerve, the amount of gland to be removed and the closure of the wound to produce the least visible scar.

In thyroidectomy we use a low Kocher incision, turning the platysma-myoides muscle back with the flap. The division of the two sterno-hyoids is ac-

complished between the anterior jugular veins. In goiter surgery as in surgery elsewhere, good exposure is important. We divide between two clamps the sterno-hyoids high, as well as the fan shaped sterno-thyroids which lie close to the gland. Before proceeding with the resection we make a firm ligation of both upper poles. This greatly reduces hemorrhage during operation and reduces the danger of secondary post-operative hemorrhage. Care is also taken to ligate the lateral veins before mobilizing the gland.

It is important to stay well within the posterior capsule to avoid the parathyroids and the recurrent laryngeal nerves. The right nerve is more susceptible to injury because of its more anterior course. It is also closely associated with the right inferior thyroid artery, an important point to remember in attempting ligation of this inferior thyroid artery. Simple pinching, pressure, or pulling of the nerve may be sufficient to cause paralysis.

In regard to hemorrhage, it is best controlled during resection by tension on the capsule. Hemorrhage from the substance of the gland is quickly and effectively controlled by slipping the finger behind the posterior capsule and raising the entire lobe forward.

The amount of the gland to be removed depends upon the nature of the gland operated upon. Thyroidectomy for exophthalmic goiter permits of extreme resection. It is asserted that one-sixth of a normal lobe will maintain thyroid function. In non-toxic thyroids some healthy tissue must remain and it is well to remember that the most healthy tissue lies in the region of the upper horns. In this type it is a good plan to leave as much of the capsule as possible, because of the possibilities of the regeneration of normal tissue. Post-operative myxedema is a rare condition, occurring occasionally after several resections on the same case or following resection for carcinoma.

We close the wound with a running suture of catgut in the capsule and in the surface of the gland, following the same by resuturing the cut muscles. In thyroidectomies we drain the majority of our wounds, nevertheless more recently we have closed many without drainage with good results. At this point I wish to call your attention to a most neglected portion of the technic, namely the closure of the skin with reference to the resultant scar. An important pastime of operated thyroid patients is to compare scars. The dread of an ugly

scar is a large factor in the postponement of urgent thyroid surgery. In our work we use a fine running stitch of plain catgut for subcuticular tension. The skin is closed with a fine, non-absorbable suture that is removed in twenty-four to forty-eight hours. The only slightly healed edges are from this time held together with thin gauze collodium strips which cover the entire wound. The patient usually leaves the hospital with two or three small transverse strips, which relieve the tension on the scar.

Close observation and good post-operative care is most essential. Large quantities of fluid intake are important. Many of our toxic cases receive 500 to 1,000 c.c. of saline intravenously before leaving the table. Water is continued by proctoclysis after the patient is put to bed. Digalen has been administered intravenously in 1 c.c. doses in desperate cases with good effect.

Dr. C. H. Mayo warns that often altogether too much is expected from the thyroid operation. He says "operations performed upon advanced cases of hyperthyroidism will not cure fatty degeneration of the heart muscles, nor fatty degeneration of the liver, nor advanced changes in other organs, although the disease may be checked by reducing the toxemia."

We cannot conclude without making some statement comparing the relative values of the exophthalmic thyroid treated by surgery and the same treated by x-ray and radium. Statistics show that of those treated surgically approximately 80 per cent continue cured after six years. X-ray and radium are contraindicated in every type except in the exophthalmic goiter. Goetsch gives the x-ray a place in the treatment of mild cases and in the preparation of severe cases for surgery, but its use may cause loss of valuable time with great increase in the surgical risk. The benefits of x-ray treatments should be estimated and controlled with the basal metabolism test.

Thus, summarizing the important factors in the treatment of thyroid disturbances we find them to consist of the need of recognizing the types of thyroid disease, the danger of operating during excessive activity of a toxic gland, the importance of the psychological consideration of the hyperthyroid patient, the need of being prepared to avoid or to treat possible accidents such as hemorrhage or tracheal collapse, and lastly the intelligent post-operative care and observation.

ANESTHESIA IN OPERATIONS ON THE THYROID GLAND AT THE SCHMIEDEN CLINIC IN FRANKFORT ON MAIN*

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The Minnesota State Medical Association and its President, Dr. Archibald MacLaren, have given me the opportunity to present to this audience some of our experiences in goiter work at the surgical clinic in Frankfort on Main. I wish to thank you, honored colleagues, very cordially.

In our clinic, local anesthesia is regarded as the method of choice in all cases of thyroid operations, except in children and extremely nervous patients.

There is no doubt that local is much safer than general anesthesia. It has the following advantages:

1. No anesthetist working near the operative field, so one of the dangers of sepsis is eliminated.

2. Vomiting, double danger for the wound and heart, happens only exceptionally after local anesthesia.

3. The risk of injury to the recurrent laryngeal nerve is not so great when you are able to watch a disturbance in phonation and to correct it immediately.

4. The advantages are striking in goiter with tracheostenosis, a form of enlargement not seen so frequently in America as in our country. Only those who often operate these forms of goiter will really appreciate local anesthesia. In these cases you may see, after beginning general anesthesia, that the breathing becomes so bad that a tracheotomy must be performed immediately. This is often followed by complications in the healing process of the wound.

For toxic goiters Kocher believed that general anesthesia is a great risk and the cause of some sudden deaths on the operating table. This viewpoint, however, differs radically from the experiences of Enderlen and Kausch in our country and many American operators who recommend general anesthesia especially for exophthalmic goiter.

In the Schmieden Clinic we prefer local anesthesia for these forms, if possible without force,

*Presented before the annual meeting of the State Medical Association, St. Cloud, October, 1924.

and so avoid the excitement which we get in ether anesthesia, which is dangerous to the heart of an exophthalmic goiter patient. But we don't force the patient. His psychic condition is the most important factor. When we see that by his nervousness the first injection of novocain is troublesome we resign all further efforts and employ ether. In the same manner as in Crile's method of anoci-association we demand that every pain and every anxiety of the patient be avoided, the pain being a great exertion and doing to the heart more harm than general anesthesia.

We like two kinds of preparations to get the patient ready for local anesthesia:

1. Psychic; the surgeon has to win the confidence of his patient in the days before the operation.

2. We prepare the patient by heavy doses of morphin and atropin. During the last year we have come to prefer pantopon, which causes much less vomiting than morphin.

Scopolamin, also recommended in the last few years, we do not use. This drug increases the excitement in some patients and in others is fatal on account of the condition of the heart muscle.

The most commonly employed method of local anesthesia which I have seen in America is the terminal infiltration by which the line of incision, the muscles and the tissue around the gland are copiously infiltrated. The method is simple and does not demand special training. But there are disadvantages:

1. The artificial edema causes a distortion of the operative field.

2. Much larger amounts of the novocain are necessary.

3. It is laborious for the operator after the dissection of each layer to inject the next one.

These disadvantages will be avoided by block anesthesia. This form can be given as a separate procedure entirely distinct and before the thyroidectomy. Successive operations can be performed without loss of the operator's time when the anesthesia, as in our clinic, is made in a separate room.

Success of blocking requires a knowledge of the topographic anatomy of the nerves.

Theoretically the field of goiter operation is supplied by the deep and the superficial branches of the cervical plexus formed by the second, third and

fourth cervical nerve. The most elegant and logical method is the central block of this cervical plexus. The lateral direct route introduced by Geiger and Hacrtel, the posterior route of Kappis and Danis and the lateral oblique route recommended in 1924 by Meeker and Hundling (Mayo Clinic) have been tried. All these three methods have the same intention: to inject the anesthetic solution in immediate proximity to the transverse process of the third and fourth cervical vertebræ, where the cervical plexus is formed.

All these three methods are dangerous in the same manner because absorption of novocain may take place in the spinal fluid and paralyze the centers of the medulla oblongata. Sixteen serious intoxications, mostly convulsive seizures and collapses, and three cases of sudden death have been reported. I believe they were caused by absorption of the novocain in the spinal canal. One case of complete permanent paralysis of the left arm occurred which Winterstein ascribed to puncture the dura through an intervertebral foramen and directly injured the cord. That is the reason why since 1921 we have refused in our clinic to use any method of paravertebral anesthesia.

Following a suggestion of Kulenkampff we use block anesthesia as successfully as paravertebral but much more safely. The deep branches of the cervical plexus being largely muscular, it is only necessary to block the superficial branches. These indeed are purely sensory. They form a plexus directly below the fascia on the posterior margin of the sternocleidomastoid muscle. The deep structures of the lateral and anterior regions are supplied by sensory nerves which pass with the superior thyroid artery. We believe that these nerves come from the superior branches of the cervical nerves and follow the sympathetic plexus winding round the artery. They will be blocked by injection close to the superior artery.

Technic.—At each side of the neck we make two dermal wheals: one in the middle of the posterior margin of the sternocleidomastoid and the other above the upper pole of the thyroid lobe. Often you may feel the pulsation of the superior artery at this point. Through the lateral wheal we inject 15 c.c. of 0.5 per cent novocain suprarenin subfascially and the same amount subcutaneously. Through the medial wheal we inject 10 c.c. of the solution subfascially only. By these four injections the whole operative field is absolutely insensible.

We have used this method since 1921; there have been no accidents or inefficiency. The safety of this method is caused by avoiding the proximity of the vertebræ. You must stop after passing the fascia.

The only danger, much greater by the infiltration method, is the injection into blood vessels. By introducing the needle without the syringe you can be absolutely sure of avoiding them, because the entrance of a vessel is easily detected by flowing blood and corrected by changing the position of the needle.

We need only 80 c.c. of a 0.5 per cent solution of novocain. We always add adrenalin. Ochsner, Crile and Mayo advise against the employment of adrenalin in toxic and exophthalmic goiter. They are afraid it may cause a serious Goetsch reaction. But I believe there are two disadvantages. In the last four months I have given the anesthetics for the goiters which Dr. A. J. Ochsner operated personally. First I employed the solution as used in this clinic, i. e., the 0.5 per cent novocain without adrenalin. However, the success of the block anesthesia was not so efficient as it was with adrenalin, and, what is more interesting, the patient without adrenalin sometimes showed more heart and nervous excitement than was seen with the use of adrenalin. So I believe that these symptoms are not caused by the adrenalin but are due to the novocain. Novocain is a mild poison, but it is a poison, and I believe that adrenalin, by delaying the absorption, prevents these symptoms of novocain-poisoning.

CONCLUSIONS

1. In all thyroid operations local anesthesia is the method of choice.

2. The terminal infiltration for goiter operation is simple but has many disadvantages. The anatomy of the neck is such that regional block methods make the operative field absolutely insensible.

3. We don't use the paravertebral methods, they being very dangerous even in the hand of a skillful specialist.

4. The described subfascial block anesthesia by avoiding the proximity of the vertebræ and the cord is without danger and is as successful as the paravertebral methods.

5. We also recommend for exophthalmic goiter the use of adrenalin in the anesthetic solution.

6. We have employed this method, without accident or inefficiency, since 1921.

ARTIFICIAL PNEUMOTHORAX FOR ACUTE LUNG ABSCESS*

EVERETT K. GEER, M.D.

St. Paul

The efficacy of artificial pneumothorax for progressive lung tuberculosis is firmly established beyond any reasonable doubt. Favorable reports without number by careful and critical workers in this country and abroad attest this statement which, therefore, may be accepted as fact.

Another field for this simple but effective therapeutic measure has been opened and found fertile: the field of non-tuberculous suppurative pulmonary lesions. Throughout the literature on pneumothorax therapy are found numerous statements that chronic lung abscess, bronchiectasis, etc., might be amenable to this procedure. The probabilities of collapsing a lung with a chronic abscess are very small, however, because of the almost universal presence of pleural adhesions in cases of more than six weeks' or two months' standing. Thoracotomy and drainage is therefore the method of choice in treating the majority of chronic lung abscesses.

With acute lung abscess (lesions of not more than eight weeks' duration) quite the reverse is true. Pleural adhesions are not likely to form within six or eight weeks, consequently the pleural space is free and the probabilities of being able to attain a satisfactory collapse of the lung are very good indeed. Parenthetically permit me to add here that since the general use of the roentgen ray in chest diagnosis, lung abscesses are being diagnosed much more frequently in the acute stage.

We are indebted to W. D. Tewkesbury² for blazing the trail in the use of pneumothorax for acute abscess of the lung. In 1917 he reported two cases cured thereby and has since added twenty-three more. Other men, as Rist,³ Johnston,⁴ Rich,⁵ White,⁶ Barlow, Kramer⁷ and others,^{3, 20} have reported their experience with no little enthusiasm. The most recent reference I have found is in the Boston Medical and Surgical Journal for June 5, 1924, where Balboni and Churchill⁸ report a cure in an eight year old child.

The technique and dangers of inducing collapse of the lung for abscess differ in no way from that

*Read before the annual meeting of the Minnesota State Medical Association, St. Cloud, Oct. 9, 1924.

used and encountered in treating a tuberculous lung. Thorough use of novocaine undoubtedly guards against pleural shock; perforation of the lung may occur if the operator is not careful at the first inflation; air embolus is also a possibility if



Fig. 1. Advanced unilateral tuberculosis, left lung.

proper attention is not given to the reading of the manometer. Pleural effusion so common with collapsed tuberculous lungs has been conspicuous by its entire absence in my experience in compressing both acute and chronic lung abscesses. When, after an inflation or two, adhesions are found to be present, it is unwise to attempt breaking them by high intra-pleural pressure; much better to discontinue air inflation and resort to surgery. The duration of treatment is six weeks to two months in the usual case.

The advantages of pneumothorax over surgery in treating acute lung abscess must be obvious. There is no operative discomfort or shock; there is no protracted malodorous drainage requiring frequent dressings; there is no resulting chest deformity.

Upper lobe abscesses respond better to collapse therapy than lower lobe lesions for apparent mechanical reasons. Abscesses which have ruptured into a bronchus and those near the root of the lung offer a better prognosis than others, also for obvious reasons. It is probably somewhat dangerous to attempt pneumothorax when the abscessed cavity is immediately subpleural because of the possibility of spontaneous rupture into the pleural cavity with its tragic results.

The rationale of pneumothorax therapy for lung abscess was clearly stated by John B. Murphy¹ in 1898. He said, "I am convinced that abscesses without adhesions and with bronchial communications, should not be treated by incision and drainage through the chest wall, but by producing collapse of the lung by injecting nitrogen gas or a liquid into the pleural cavity, thus compressing the lung and allowing the connective tissue in the wall of the abscess to contract and obliterate the cavity with the aid of the bronchial drain. Allow the wall of the abscess to collapse, to empty thoroughly and it will heal as other abscesses of the same pathologic character; this I believe is the keynote to the successful treatment of pulmonary cavities."

Case Report.—A male, aged 35, with unimportant family and past history, was subjected to tonsillectomy under general anesthesia, March 14, 1922. He left the hospital two days later feeling fairly well, but with an unproductive cough. Three days following this he had severe chest pains and fever 101 degrees and went to bed. His cough became worse and he felt no better. Four weeks after his operation he had a severe coughing spell and raised a cupful of foul sputum. The next week he began hemorrhaging and bled profusely for a week, at the end of which time I saw him. He was somewhat emaciated and racked by constant cough and looked almost moribund. Physical examination was essentially negative except for apparent consolidation of the right upper lobe. Films of his chest

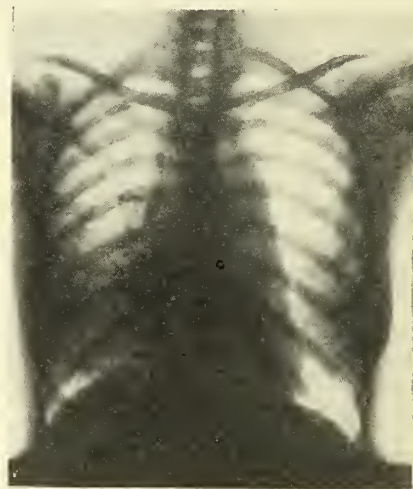


Fig. 2. Same case as Fig. 1 after pneumothorax. Complete collapse effected of left lung.

showed a dense right upper lobe lesion. He had a moderate leucocytosis and no tubercle bacilli in his sputum.

He was given 1,300 c.c. of air into the right pleural space, followed in twelve hours by 700 c.c. more, and in another twelve hours by 500 c.c. more. He stopped bleeding. His cough improved quickly and he had an uneventful convalescence.

Films of his chest six months later showed no signs of past or present pathology. He has been alive, well and working ever since.

Here we have a striking exhibition of the virtue of collapse therapy for acute lung abscess as well as for pulmonary hemorrhage.

My purpose in presenting this short paper is not that I have something quite new to offer. It is rather an attempt to refresh your minds and emphasize that in artificial pneumothorax, a simple, painless, bloodless procedure, we have a brilliant therapeutic measure which has given more than 80 per cent absolute cures in over 100 cases of acute lung abscess.



Fig. 3. Acute abscess upper lobe, right lung.

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DISCUSSION

DR. W. S. LEMON, Rochester: Doctor Geer has given a brief account of the spectacular recovery of a patient under a rather recent method of treatment. It is applica-



Fig. 4. Same case as Fig. 3 after pneumothorax. Partial collapse of right lung.

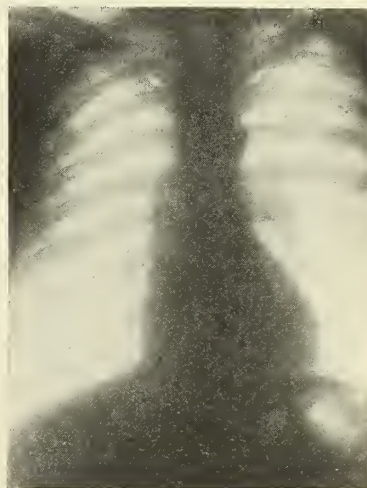


Fig. 5. Same case as in Figs. 3 and 4 six months later. Right lung expanded; no demonstrable pathology.

ble to a limited number of patients and is not intended for all types of pulmonary abscess. Forlanini, in 1894, advocated the method, but employed it only for cases of tuberculosis. However, in 1910, he treated a lung abscess of six years' duration and the patient was better after a period of twenty-five months. Murphy, in 1893, advocated the use of pneumothorax, and Doctor Geer has quoted from his paper in which he foretold its use in the treatment of non-tuberculous infections of the lung. In 1917, Tewkesbury used the method, and in his report asserts that until that time tuberculosis only had been so treated, with the exception of a few cases of chronic lung abscess and a case of interlobar empyema reported by A. E. Greer in 1916, in which a cure was obtained in three weeks. He felt that he could advise pneumothorax in acute cases in the hope of reducing the mortality, which at that time was as high as 60 per cent for patients under medical management, with cures of only 10 per cent, and 30 per cent in surgically treated cases, who not only had to face this high mortality, but the possibility of deformity and frequently of persisting sinus.

These percentages have been reduced in recent years with the employment of better methods of technic. We find in Walker's series a medical mortality of 50 per cent and a surgical of 25. In 1919, Hedblom reported sixteen cases of abscess treated surgically at the Mayo Clinic, with a mortality of 18.7 per cent. "All patients were operated on regardless of the fact that several were desperately ill and, therefore, were very poor surgical risks. Operation afforded them the only hope of recovery."

Rich, in 1922, again called attention to pneumothorax as a method of management in acute abscess; he reported ten cases, in eight of which pneumothorax was used. Two patients had recovered spontaneously, and two died during treatment. At that time, if one counts Tewkesbury's cases, twenty had been so treated, with sixteen (80 per cent) complete cures. Rich advocated the early use of pneumothorax, feeling that the best results were obtained in cases in which the lungs were collapsed during the second and fourth weeks, and that the compression should be kept up for at least four weeks.

This method applies particularly to those acute conditions that have not as yet produced sufficient pleuritic adhesions to bind the lung to the chest wall, to the lung abscesses in which hemorrhage is profuse, and to abscesses distant from the periphery, or difficult to localize.

Other types of lung abscess should be treated by various methods. Medical management often results in spontaneous cure; it consists in confining the patient to bed in the open air and on a full, nutritious diet of foods of high caloric content, such as milk, eggs, custard, gelatins, chocolate, and the like. Lockwood advises the use of bicarbonate of soda in doses of from 100 to 120 grains a day, to prevent acidosis, and of glucose in 5 per cent solution every two hours in amounts of eight ounces.

With the medical management should be mentioned the use of salvarsan, particularly for patients who have spirilla or fusiform bacilli in the sputum. Very splendid results have followed the use of salvarsan in these cases.

Medical management also includes Pritchard's method

of rest. It also should include the use of the bronchoscope, as advocated by Jackson, Lynah, Yankeur, and others, which accomplishes four purposes: the aspiration of pus from the lung, the irrigation of the cavities with antiseptic solutions, the removal of foreign bodies from the abscessed areas, and, probably best of all, the dilatation of the bronchus leading to the cavity, which is frequently stenosed. This method was used as early as 1860 by Green, who attempted to catheterize abscesses, and to inject directly into the bronchial tube.

While a patient is under medical management for abscess, a postural position should be selected which best evacuates the abscess, and the patient should be encouraged to assume this position several times a day. It is often advisable to use inhalations, preferably of creosote, because of its deodorant qualities and because its irritability prompts cough and complete evacuation. With the reduction of the odor, the patient's appetite improves.

Such medical treatment should be continued indefinitely, provided the patient's general condition and weight improve, the temperature is not elevated, and the amount of cough and sputum is reduced.

However, if patients under medical management fail to improve, and their leukocyte count remains high, then surgical treatment should be resorted to. Early operation is advisable if the abscess is peripheral and well localized, or surrounded by dense fibrous tissue, if it is large and draining badly through the bronchus, or producing such large quantities of pus that there is danger of the patient drowning himself in his sputum, or of the opposite side becoming infected.

GEORGE D. HEAD, M.D., Minneapolis: Mr. Chairman: I was just thinking back over my experience. I am thoroughly convinced that where the drainage through a bronchus is not good, and where the abscess has continued over a period of six months, it is very desirable in a majority of these cases to establish surgical drainage. I have had no experience with the artificial pneumothorax management of these cases. The results shown here today certainly would indicate that we ought to have a wider, a larger and a longer experience on the results of such treatment in these patients.

One factor in the management I wish to call your attention to. It is up to the surgeons to devise a better method of handling these abscesses of the lung than is at present employed. In a number of cases that I have been connected with, the two-step operation method of handling these cases has been used, and I must confess that, so far as I can see, these cases have done the best of any that I have handled. I mean that, instead of making an incision into the abscess and going into the lung through an open pleural cavity, the two surfaces of the pleuræ are stitched together in the first step of the operation and, after the pleuræ have closed, a second operation opens the abscess and the drainage is through a closed fistulous opening. I have seen a number of these abscesses drained through an open pleural cavity and it has always struck me as poor surgery.

DR. M. GEORGE MILAN, Warren: Mr. Chairman: Having in mind the method of Dr. John Ritter of Chicago,

wherein he attempts in the treatment of pulmonary tuberculosis to eliminate and destroy the secondary micro-organisms by means of iodine therapy in the hopes that it would help the lesion to fibrose, I treated a case of pulmonary abscess about a year ago where the patient had been subjected to a pelvic operation and a tonsillectomy on the same day. An upper lobe pulmonary abscess developed. In addition to rest and dietetic treatment, the patient was given small doses of tincture of iodine internally with milk. While on this treatment, the patient showed streaked sputum, which factor led me to discontinue the iodine.

I believe that it was possible that the iodine may have been the etiological factor in the streaked sputum, but, of course, one cannot say this positively. However, I have wondered just how much this treatment had to do with the patient's convalescence. The case made a splendid recovery.

DR. GEER (closing): Mr. Chairman: I was very much interested in looking over the literature from the surgical standpoint to see what the surgeons had to say about the treatment of lung abscesses, and I found that very few of them will admit the fact that pneumothorax should play a very important therapeutic part in the treatment of them. I think the reason is that by the time the lung abscesses get to the surgeons they have become chronic cases in which we can not effect a satisfactory collapse of the lung.

Heuer, of Cincinnati, says that pneumothorax may be used to determine the extent of the adhesions present. It seems to me, if adhesions are not present, it would be unwise, at least, not to attempt complete pneumothorax to see if collapse would not do good instead of stitching the pleural cavity to create these adhesions.

In a recent article on lung abscess by Willy-Meyer, it was stated that pneumothorax should be tried first. But the experience of the surgeons has been mostly with chronic lesions and has not been satisfactory. In one case of chronic abscess I tried to break the adhesions by high intra-thoracic pressure. The adhesions pulled off, the abscess ruptured into the pleural cavity. The shock from the toxemia was profound; the patient ran a temperature of 95 and a pulse of 100 for five or six days. She survived it, however, and was operated for the empyema and eventually was cured. That is why I pointed out in my paper, it is exceedingly unwise to attempt high pressure for the relief of adhesions.

But to come back to our subject, acute abscess of the lung without adhesions is a most favorable subject for induced pneumothorax and should be always considered.

Inhalation of "Carbona."—A periodic drinker used the cleaning fluid, "Carbona," to produce unconsciousness when inhaled. Carbona contains carbon tetrachlorid as its essential constituent, carbon disulphid being generally present also. Carbon tetrachlorid has been tried as a general anesthetic and found unsatisfactory. The carbon disulphid greatly increases its toxicity when inhaled. (Jour. A. M. A., Aug. 9, 1924, p. 461.)

BREAD SUBSTITUTES IN DIABETIC DIETS*

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Most erroneous ideas concerning breads and bread substitutes are abroad. Forty-eight of the fifty diabetic patients in our ward received advice from physicians at home that one of the substitutes for white bread listed in Table 1 should be used in place of white bread, the latter being regarded, evidently, as peculiarly injurious, and the substitute as comparatively innocuous. Most of them had had no advice that there was any need of restricting the amount of the substitute. A few had been told to eat a limited amount, but usually the limit was but vaguely understood. Two of the patients were physicians themselves. Because of this widespread misunderstanding, the demonstration in Figure 1 was arranged to illustrate graphically the actual glucose equivalents of like amounts of various breads. The Atwater and Bryant tables of food values were followed, and 5 gm. lumps of sugar were piled like bricks to represent the amount of sugar derivable from 100 gm. each of several kinds of bread and bread substitutes. It will be observed that there is relatively little difference between the size of the piles of sugar.

The least excusable misconception is that dark bread, or graham bread, is relatively innocuous. The fact that the actual carbohydrate content of various breadstuffs does not differ greatly is not realized, nor is there any general appreciation of the rôle played by protein, which, in large part, may be converted by the body into sugar. Thus, in the so-called gluten breads or flours, as the carbohydrate content is reduced by removal of the starch, the proportion of protein is increased, and the total sugar value, so far as the metabolism is concerned, is altered but little.

Gluten flour seems to be the most popular wheat flour substitute. Pure gluten, a sticky, viscous mass, cannot be used to make bread, and the palatability of gluten-flour products is almost in direct proportion to the amount of starch they retain.

*Work done in the Section on Medicine of the Mayo Clinic under the direction of Dr. R. M. Wilder.

Fetterolf, who has analyzed various brands of gluten flour, finds the carbohydrate content of this to vary from 13 per cent to 71 per cent. The latter figure compares favorably with the starch content of white flour (Table 2). The glucose value of certain brands of gluten bread actually exceeds that of white bread (Table 3).

Bran is another popular flour substitute, but the starchiness of bran breads is of as little concern to some doctors as the variations in the color of mulattos. Yet, the baker's variety of bran bread,

tic results with diabetic patients emphasize not so much the kind of food that the patient may eat, as the amount. A pound of spinach and an ounce of white bread are equivalents in glucose-yielding capacity. There is no evidence that the one is any "better" as a diabetic food than the other, provided the bread is eaten as slowly as the spinach. Patients and doctors must consider foods and diets quantitatively, and not qualitatively. If a patient's tolerance is adequate for a pound of spinach, but he prefers an ounce of bread, why not bread? But

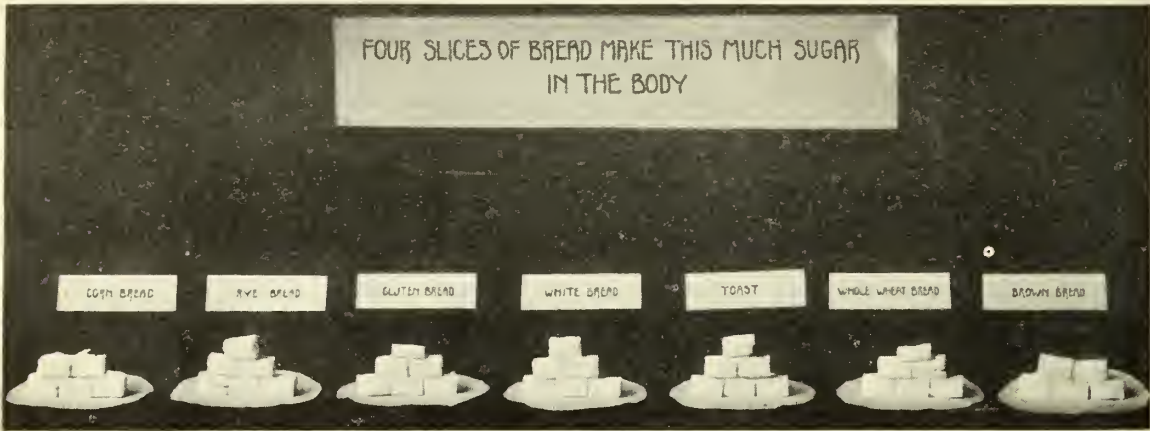


Fig. 1. Relative amounts of sugar produced in the body by corn, rye, gluten, white, whole wheat, and brown breads, and toast.

despite its African complexion, is usually quite as "starchy" and as deadly as its Nordic cousin, the white loaf. If bran is thoroughly washed and made into cakes with agar or fat, the sugar equivalent of the resulting product will be quite low, and the only objection to the use of bran thus prepared

give a bread, the composition of which is known, and give a prescribed amount.

Bread remains the staff of life. However, the tolerance of many patients is too low for bread, and a substitute is often desirable. In such cases, casein flour and soy bean flour are probably the most useful wheat flour substitutes. Ground-up wood, the so-called cellulose flours, are completely without food value and also extremely unpalatable. Casein, being a protein, should be considered as 58 per cent carbohydrate. The soy bean meals contain carbohydrate, but not more than 8 per cent is assimilable. In addition, they contain 20 per cent of protein and 30 per cent of fat and, consequently, are not "innocuous." For the diabetic, food of all kinds is like dynamite, indispensable, but to be handled with due caution.¹

TABLE 1		
BREAD ADVISED BY HOME PHYSICIANS		
Types		Cases
Gluten bread		24
Graham bread		12
Rye bread		12
Whole wheat bread		7
Bran bread		6
Toast		5
Dark bread		1
Brown bread		1
Soda crackers		1

will come from its irritative action on the intestine. We have observed cases of badly disordered intestines resulting from the use of bran, and have largely abandoned it.

Physicians who are obtaining the best therapeutic

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TABLE 2
SUGAR VALUE OF GLUTEN FLOURS
(From the analyses of Fetterolf)

Material	Manufacturer	Grams of sugar for each 100 gm. flour	Fat, per cent	Protein, per cent	Carbo- hydrate, per cent
Pure gluten flour	Battle Creek Sanitarium				
	Food Company, Michigan..	57.9	0.9	78.9	12.6
Gluten flour (40 per cent)	Battle Creek Sanitarium				
	Food Company, Michigan..	72.9	1.7	39.0	50.1
Self raising gluten flour (40 per cent)	Battle Creek Sanitarium				
	Food Company, Michigan..	72.7	1.0	38.6	50.1
Gluten flour (20 per cent)	Battle Creek Sanitarium				
	Food Company, Michigan..	80.5	0.7	21.0	68.2
Pure gluten flour "Glutosac"....	The Health Food Company,				
	New York	75.3	0.6	35.2	55.0
Gluten flour	Unknown, Danville, N. Y....	79.7	2.5	15.5	70.8
Diabetic flour	Farwell and Rhines, N. Y....	82.8	0.4	11.9	76.4
Diabetic biscuit flour	Unknown	50.2	8.9	75.2	5.8
Plasmon meal	Plasmon Company of				
	America, New York City..	45.5	2.7	78.6	0
*Cornmeal .....	.....	80.9	1.9	9.2	75.4
*Whole wheat flour .....	.....	79.6	1.9	13.8	71.9
*Wheat flour, graham .....	.....	79.1	2.2	13.3	71.4
*White flour .....	.....	80.7	1.0	11.4	75.1
*Rye flour .....	.....	82.7	0.9	6.8	78.7
*Soy bean meal .....	.....	26.3	20.0	42.0	0

*Analytic figures from Atwater and Bryant, included in the table for comparison with the gluten preparations.

TABLE 3
SUGAR VALUE OF GLUTEN BREADS
(From the analyses of Fetterolf)

Material	Manufacturer	Glucose equivalent of each 100 gm. bread	Fat, per cent	Protein, per cent	Carbo- hydrate, per cent
Pure gluten biscuits.....	Battle Creek Sanitarium				
	Food Company, Michigan..	67.2	3.3	48.3	39.0
Gluten biscuit (40 per cent)....	Battle Creek Sanitarium				
	Food Company, Michigan..	73.0	2.7	36.3	51.9
Potato gluten biscuit	Battle Creek Sanitarium				
	Food Company, Michigan..	56.9	2.6	75.6	13.2
Average gluten bread	From figures of Atwater and Bryant	55.0	1.4	9.3	49.8
White bread	From figures of Atwater and Bryant	58.5	1.3	9.2	53.1

THE TREATMENT OF EXTENSIVE INJURIES OF THE SCALP*

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Warren, Minn.

Total or partial avulsions of the scalp, though not of frequent occurrence, are met with occasionally. Total avulsions are not encountered as often as formerly, largely due to the protective devices surrounding machinery; but on farms where women are working around unprotected power-driven apparatus, these accidents still occur, since the hair may become entangled in revolving shafts which tear off the integument. In men, however, with their short hair, these accidents are practically impossible but where automobile accidents are so steadily increasing, one will see victims that have been pushed or pulled over the hard ground to such an extent that large areas of scalp are destroyed and the underlying bone either fractured or scraped until it is no longer viable.

The interest attached to these accidents lies in the difficulty in covering the avulsed parts with skin. Most text-books advocate that the avulsed scalp be put back if the patient is seen early. This is good surgery from a theoretical point of view but practically never successful because of loss of viability, since it is essentially a full thickness pedicle graft without the necessary pedicle. The chief drawback is the lack of a sterile field and the fact that the graft becomes infected, with the result that everything sloughs. Where some of the soft parts remain, granulations spring up and a suitable base for grafting is soon established, but where the bone lies bare and hard, the problem is different. The cranial bones being of a flat type have little power of regeneration after the pericranium is removed, so that the uncovered bone remains in that state for months and years before granulations spring in from the sides, the suture lines, or up from the diploe when the outer portion of the bone has been flaked off after years of work on nature's part. This is a slow, long-drawn-out process, tedious not only to the patient but also to the surgeon.

In the early days when scalping was part of Indian warfare, areas of denuded bone in recovered victims were common and to a frontier surgeon do

we owe one of the methods of treatment we pursue. This method was first described by Robertson¹ and later revived by Sneve, Law² and Mayo.³ It consists in drilling many small holes in the outer table of the skull down to the diploe until bloody serum escapes. Through these perforations new granulation tissue springs and covers the bone, furnishing a good vascular base for grafting after a few weeks. Its advantage consists in the rapidity with which granulations form, but its disadvantage lies in the danger of infecting the diploe. This is very remote, however, since the patient is usually immune to the existing infection. On the other hand,

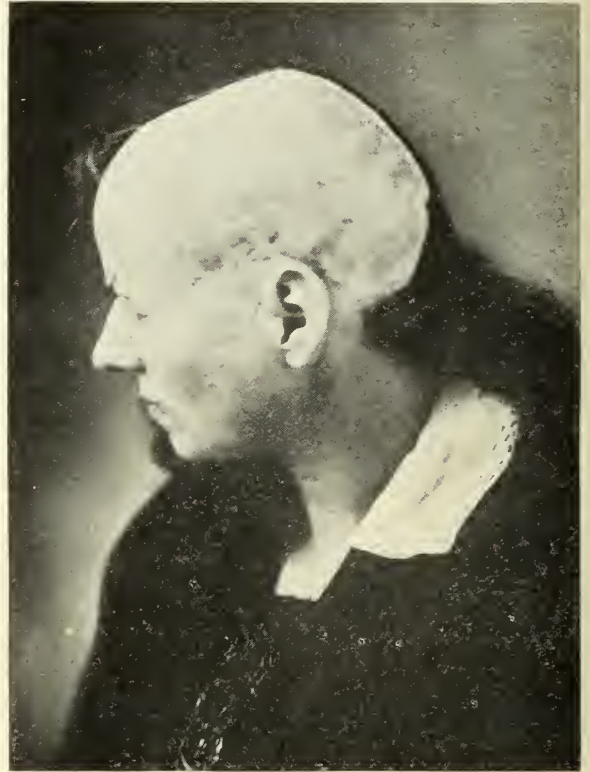


Fig. 1. Case 1. Scalp after complete healing.

where the bone is partially destroyed and so badly impregnated with infected material that drilling through it is hazardous, as in one of my cases, and where it is impossible to sterilize the bone, a better method consists in removing the entire outer table by means of a broad chisel. All the infected material is removed, free drainage results and an excellent growth of granulation tissue whose vascularity is unquestioned covers the area in a few weeks. Adson has used this method in an obstinate case of luetic osteitis of the cranium which resisted

*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, October, 1924.

all attempts at healing under specific treatment but which healed promptly after removing the outer table.

When all the areas are covered with healthy tissue, the question of grafting arises. In cases where the patient is seen soon after the accident, McWilliams⁴ has recently advocated full thickness skin grafts prepared from the avulsed scalp. Its success depends upon attention to details for there must be perfect hemostasis over the raw areas, while the avulsed scalp must be shaved, cleansed and cut into strips for transplanting, and after transplant-

properly used, is the best for it digests all necrotic material besides making the field aseptic; but for a day or two before the expected grafting it should be discontinued and normal saline dressings applied. Besides the use of antiseptic dressings, we have found that free exposure of the granulations to sunlight or a thermolite for two or more hours a day aids materially in shortening the time of sterilization. It promotes an active exudation of serum which is bacteriolytic and which carries the organisms out from the deeper layers onto the surface, where the antiseptics can exert their effect.

Of the grafts, the Thiersch graft is the most practicable, since it covers large areas, and there is always a high percentage of success, provided it is an autogenous graft and the field is free from moisture. In adults, skin from the thigh can be removed under novocain anesthesia with little inconvenience. Masson advocates Thiersch grafts taken from persons belonging to the same blood group. The writer has never tried this method where the patient has been grouped, but he has seen failure in all cases where the graft has been taken at random. Reverdin or pinch grafts may also be used, but they have no advantage over the Thiersch graft. It takes a longer time to get results and the resulting scar is more irregular. Ordinarily, after one or more graftings, the skull is covered, but after a time small areas show themselves where the new skin loses its vitality and a small ulcer results over which the epithelium creeps in from the edges very slowly.

Where the defect is not too large, and especially in children, where we hesitate to resort to frequent grafting under general anesthesia, the adhesive plaster method of Beck is ideal. These plasters, when fastened from the healthy scalp onto the granulations, press down the hard venous ring at the edges and permit the new epithelium to grow in from all sides. The straps may remain two to four weeks between dressings and, even though there is an abundance of pus of bad odor underneath them, the skin seems to thrive. To our aseptic minds, it seems crude, but it is physiologic. Nature, in healing a wound, covers it with a crust made up of wound secretions, which, when dry, presses on the granulation tissue, preventing a venous congestion and allowing the new epithelial cells to creep in. If we pick up such a crust, we invariably find some pus and serum underneath.



Fig. 2. Case 1. Patient wearing wig.

ing, the graft must be held firmly in place by immovable bandages. The method sounds reasonable and is ideal since it covers the parts with skin that comes from that region. The drawback is the difficulty in cleansing the scalp and in seeing the patient early enough.

The average case falls into the group where infection is present and denuded bone must be covered by either one of the methods mentioned before. Here, it is necessary to render the tissues reasonably clean. For this purpose, Dakin's solution, when

This is the counterpart of the use of adhesive plasters. As was stated above, it works well in children, who do not always tolerate frequent dressings.

The observations mentioned above were made on two cases reported below, one being a partial avulsion, while the other was in a fracture of the skull associated with a large denuded area of temporal bone.

Case 1.—N. H., aged 31. July 22, 1922, while washing clothes with a washer run by a gasoline engine, her hair caught in one of the flywheels and the scalp was pulled off the left side of the head. She was immediately brought in by her brother.

There was very little shock, practically no pain, and only a small amount of bleeding. The scalp was completely torn off three-fourths of the head and on the remaining portion was loosened, but not detached. The avulsed area corresponded to a line drawn from the midline posteriorly below the occipital protuberance running to the right to a point about three inches from the midline over the right ear, swinging over the top of the forehead on the right and downward to the left supraorbital prominence and then backward above the left ear, then downward to the point of origin below the occiput. The jagged edges of the remaining scalp were loosened to four inches back and the whole raw area was covered with hair, grease and dirt.

The raw surfaces were cleansed and the remaining portion of the scalp shaved, the lacerated edges were fastened to the loose pericranium to prevent retraction. Normal saline dressings were applied.

The wound was dressed daily with Dakin's solution, the infection cleared up and granulations suitable for grafting appeared. The loosened scalp had adhered and only slight sloughing took place. Over two areas at the temporal and parietal regions of the left side, the pericranium sloughed, leaving dry, white, hard bone.

Aug. 18, 1922, under novocain anesthesia, Thiersch grafts were obtained from both thighs and the entire surface covered, while in the eburnated bone, holes were drilled to the diploe. The majority of the grafts took and granulations began to cover the eburnated bone in three to four weeks. The wound was dressed daily with Dakin's solution. On Aug. 24, she was discharged from the hospital—coming to the office for dressings.

Oct. 1, 1922, she re-entered the hospital and, under novocain anesthesia, more Thiersch grafts were removed from the thigh and placed over the parietal region. She was again discharged from the hospital on Nov. 1, 1922, with scalp healed, except in a few places where the skin would break down. She returned to the office at various times for dressings and was discharged Jan. 3, 1923.

At present, the skin is firm over the scalp, but it is hard to the touch, atrophic in appearance, and has a tendency to scale, while now and then small areas of necrosis appear which heal slowly. She wears a wig and is acting as a telephone girl.

Case 2.—E. H., aged 5. Aug. 18, 1923, while walking across the street with her father, she was struck by an automobile in such a manner that her head was pushed into the gravel. She was carried about fifty feet before the car was stopped.

On examination, she had an area four inches in diameter over the right temporo-parietal area, where there was complete absence of soft parts. The bone was exposed and deeply impregnated with dirt and sand. The patient was in shock, so nothing was done except to treat that condition.

On the following morning, under gas oxygen anesthesia, examination showed the bone as described above and a large part of the temporal muscle gone, while at the lower portion was a linear fracture with a few particles of hair



Fig. 3. Case 2. Scalp following injury showing eburnated outer table of skull in center.

and sand protruding. A decompression was done over the fractured area, and sand to the depth of one-eighth inch lying between the dura and skull was cleaned out. The wound edges were debrided, the whole covered with rubber tissue and wet dressings applied.

During the first few days, there was a high temperature and a free discharge of pus, but this gradually cleared up under Dakin's and exposure to the sun. At this time, the writer left for an extended trip and the case was turned over to his associate, Dr. T. Bratrud. On Sept. 29, the wound was clean, but there was no attempt at granulations springing over the bony area. Since the outer table had been so thoroughly ground up by the sand, it was not

deemed advisable to drill holes, but the outer table was chiseled off down to the diploe. This carried away the bone which was potentially infected, leaving a large raw area to granulate. Flamed adhesive straps were applied over the whole denuded portion and the child discharged from the hospital. By Oct. 15 granulation was complete and new straps were applied. She was dressed off and on until Jan. 5, 1924—sometimes retaining the adhesive as long as three and four weeks. There was considerable pus, but epithelization progressed rapidly. On June 5, the wound was completely healed.

Examination June 30 showed the area covered with skin which was smooth, firm and pliable, while at the lower angle was a small pulsating area corresponding to the



Fig. 4. Case 2. Scalp six months later. Complete healing, after removal of outer table.

defect in the bone. The skin showed no tendency to break down and was covered with a fine growth of lanugo hair.

In comparing the two cases, it is felt that in large defects, such as in the first, Thiersch grafts are the proper procedure, and where the bone has been denuded but has no inherent infection, drilling down to the diploe is advisable; but where the soft parts are completely missing and the bone is badly infected, the best thing to do is to remove the outer table to allow granulation. Granulation is much

more rapid and its vascularity better than in the former method.

With reference to epithelization in defects not larger than mentioned, especially in children, where one does not like to resort to repeated skin grafting, the use of adhesive straps according to Beck's method is superior to any other. It is probably more time consuming and more uncleanly, but the skin which grows in from the edges is firmer and better. It is made up of cells inherent to that locality, whereas the skin obtained by grafting is thin, has a tendency to scale, and may break down easily, which I think is due to contracture of the connective tissue. This method is not only applicable to scalp and skull wounds, but to any large wound over the body.

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DISCUSSION

DR. H. P. RITCHIE, St. Paul: The point in avulsion of the scalp is that granulations must be present for any epithelial tissue to take hold, and when these show then there is always some amount of infection. The Ollier Thiersch form of the large grafts is the one that meets infection better than the full thickness graft. It is nothing but an outer thin layer of skin and consequently in itself has but little viability and therefore will take hold under circumstances where the full thickness skin graft will fail. The full thickness skin graft requires a clean wound. A small deep graft will also take on granulation surfaces, so that we are practically limited to these two grafts in covering up these surfaces. If the large thick graft (the Krause-Woulfe) is used, it must be anchored by stitches, because it is most elastic, with great tendency to contract. To put this graft under stretch is impossible, as there is usually nothing to sew it to. It is therefore almost excluded from use under these circumstances. I have never seen it mentioned and do not know whether it is possible, but I have wondered if in partial avulsion it would not be possible to use the full thickness skin graft, as the conditions would be exactly the same as those in the forehead, where we use it to substitute tissue removed for other purposes. I think it ought to take. The best graft for these granulating surfaces is the small deep graft of Davis. It takes under any and all conditions and carries but little penalty for failure. At least, it could be used in conjunction with the large thin graft of Ollier Thiersch.

DR. A. C. STRACHAUER, Minneapolis: Is there any

additional discussion? If not, I am going to take the privilege of saying a few words. I want to emphasize particularly the importance of the drilling of the external plate of the skull in complete avulsion of the scalp. I would present the picture of a case in which the scalp has been completely pulled off, as by a laundry mangle, and we are confronted with a large, black area of bare bone without even periosteal covering. Following the perforating of the external plate with small drill openings, like a cullender, the granulations come up from the diploe and

spread over the denuded surface with surprising rapidity, after which the area may be covered by grafting.

DR. O. N. MELAND, Warren: I just want to emphasize the fact that has been brought out, and that is that these cases are tedious not only for the surgeon, but also for the patient, and any new matter that can be brought out, of course, is welcome. In the first case that was shown, a small piece of the original scalp was transplanted over the eyebrow to make a new eyebrow, and really it looked well, but it failed to take.

CALLS DENTISTRY BRANCH OF MEDICINE—EDUCATIONAL EXPERT SAYS COLLEGES SHOULD RECOGNIZE THE RELATIONSHIP

The next great forward step in dental education should come through placing it on a parity with medical education, dentistry being considered a specialty of medicine dealing with the oral region, diseases of the teeth, and of the tissues immediately adjacent, Dr. William J. Gies said in a recent address at the University of Minnesota. He represents the Carnegie Foundation for the Advancement of Teaching. This is particularly true, Dr. Gies said, because medical men have ignored to a great extent the study of the causes of tooth decay and the afflictions of parts of the body intimately connected with the teeth.

"Antagonism between medicine and dentistry cannot be explained on any basis of public interest or advantage, and has no justification in any sentiments that are worthy of respect," he said, "for both professions are agencies for health service and cannot perform that service faithfully on any other conditions than those of earnest and effective co-operation."

Dr. Gies recommended also that higher intellectual standards be demanded for admission to dentistry, saying that such standards "by making its pecuniary rewards seem too long delayed, would tend to keep out of the dental profession individuals with acute commercial proclivities and strong mechanical bent who would be more useful and more appropriately occupied in one of the mechanical trades than in a profession. This higher educational standard would repel those of low professional instinct, and would attract the high minded men and women to whom professional service makes its strongest appeal."

"Dentistry," said Dr. Gies, "will not be able to meet the full requirements of modern oral health service until dentistry attains the educational quality of medicine, but such educational equality does not require educational identity."

"At present there are 43 dental schools in the United States, thirty-three of which are contained in or affiliated with universities. Only twenty-two of the forty-three schools—one more than a majority—required work in an academic college for admission in September, 1924, at least one year

of such work having been first exacted effectually by fourteen schools in 1921 under the leadership of the Dental Faculties Association of American Universities. Minnesota is one of the universities enforcing this requirement.

"Very few practicing dentists in this country have been students in an academic college. Practically all of the graduates of dental schools in this country, including those of 1924, have been trained in institutions where the professional curricula were based on academic requirements from 'possession of a good English education' to graduation from a high school.

"Those who urge that dental education be continued on a high school basis in order to prevent depletion in the supply of dentists and consequent interference with their distribution, also magnify the significance of temporary losses, in the number of new practitioners that usually ensue from the initiation of higher scholastic requirements. They disregard the ultimate gain in number of practitioners that may be expected to follow removal of the stigma that dentistry is an ignorant profession and therefore inferior. They ignore the circumstance that loss in the number of poorly educated and uninspired practitioners would constitute a relative gain for the profession in character, and for the public in quality of oral health service. They fail to appreciate the fact that uniform geographic distribution of dentists is unattainable under any normal social and economic circumstances, and that even overproduction would not enforce such distribution, but would develop congestion in centers of population. In 1900 the number of dentists for each 100,000 of total population was 37; in 1910 the number was 43; in 1920 it was 53. This steady gain in number and percentage of dentists was made on an inclined plane of requirements in both the preliminary and professional phases of dental training."

To this end he recommended increasing the number of pre-professional years in the medical curriculum from one to two.

"Pre-medical and pre-dental curricula could be made practically identical," he continued. "Pre-medical work and pre-dental work in the colleges could be more economically organized in one curriculum than in two."—U. of Minn. News Service, Nov. 6, 1924.

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION,
SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN
MINNESOTA MEDICAL ASSOCIATION, AND MINNE-
APOLIS SURGICAL SOCIETY

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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VIII FEBRUARY, 1925 No. 2

EDITORIAL

Postmortems

Vienna became the medical center of the world through its adoption of routine postmortem examinations. The Viennese medical authorities, brilliant though they were intellectually, never would have attained their preeminence had it not been for their unusual opportunity for studying pathology. No further argument should be necessary to establish the importance of routine postmortem examinations to medical science and therefore to humanity at large. Even though an autopsy may

simply confirm the clinical diagnosis, such confirmation serves to put established facts on a more secure foundation and where the true cause of death is revealed in an obscure instance the value of such a procedure in an educational way is incalculable. A single autopsy might well undermine the assumption of our chiropractic friends as to the cause of disease.

The percentages of autopsies obtained in hospitals in this country vary from zero to one hundred. While the situation has improved somewhat in recent years there is great room for improvement. It is rightly said that the professional standing of a hospital may be accurately gauged by the percentage of autopsies performed.

Numerous factors are responsible for the comparatively poor general showing in this regard. If the hospital management, particularly in public institutions, is not alive to the importance of the problem little can be accomplished. Special attention must be paid to the procedure of carrying out the details of such an examination. Too often the filling out of forms is left to an inexperienced or lazy interne. In case of private patients the physician himself, while the logical one to make the request, too often doubts his own tact in a delicate situation and remains silent. Often the nearest relative of the deceased, from a false sentimentality or misinformation as to religious doctrines, refuses the necessary permission. Permission should be in the form of a request to the hospital authorities for an examination (avoiding the words postmortem or autopsy) to determine the actual cause of death. A progressive physician would never object to being checked up in his clinical diagnosis by a pathological one.

One obstacle in the way of progress along this line is the misunderstanding commonly exhibited between undertakers and the medical profession. The viewpoints of the two professions are absolutely different and we must admit that our profession has very generally shown a disregard for the undertaker's standpoint. An autopsy, no matter how restricted, does make the undertaker's work more difficult.

Our organized state and county societies might well investigate the subject in all its phases just as the Pennsylvania Association has recently done. The report of the committee appointed to investigate the subject is most complete and shows what can be accomplished along this line when an ear-

nest attempt is made. A little publicity work along this line in the way of radio broadcasting or articles in health magazines would be worth something. Although a gruesome subject in general, it is not an uninteresting one to the average layman.

A little co-operation between pathologists and undertakers as to methods of technic which will least interfere with the preparation of the body for funeral services might go a long way towards removing some of the antagonism towards the procedure.

The complete autopsy is doubtless the most scientific procedure and least likely to overlook abnormalities. There is no question but what the complete autopsy renders proper undertaking most difficult. As a matter of fact in an obscure clinical case there are usually certain points the clinician wants cleared up and would give a great deal to have settled. A little co-operation would accomplish much.

Legislation

At the last annual meeting of the House of Delegates of the Minnesota State Medical Association the Legislative Committee of the Association was instructed to attempt again the passage of a bill to reduce the statute of limitations affecting malpractice suits, from six to two years. Acting on these instructions a bill has been submitted to the present legislature with this object in view. A similar bill submitted four years ago was not approved in committee and was therefore not submitted to either house.

The situation today in Minnesota as regards malpractice suits is not at all satisfactory from the standpoint of justice. The actual number of malpractice suits against members of the profession has increased enormously in number and in the amount sued for in recent years. The vast majority of such cases have absolutely no just foundation, and do not get very far. The increase in legal expenses of the State Association of approximately a thousand dollars a year for the last three years in the defense of the comparatively small percentage of such suits handled by the Association is indicative of the seriousness of the situation in Minnesota. If the situation continues insurance rates are bound to go up.

We would not for an instant argue against curtailing the right of a patient to sue when he thinks he has been wronged. That most suits are in the nature of blackmail does not militate against the inherent right of an individual to at least partially correct a wrong done him. The possibility of suits acts as a curb on the careless or inefficient physician or surgeon. Such right should, however, be subject to limitations.

No statistics are available as to the percentage of malpractice cases in Minnesota in which the alleged malpractice occurred over two years previous to the suit. Probably a very small percentage in fact exceed two years. But the existence of the liability for six years from the rendering of professional services constitutes an unnecessary liability which should in justice be removed.

In nine states the statute of limitations is only one year. In such representative states as New York, Massachusetts, Pennsylvania, Illinois, Iowa, Wisconsin and North Dakota the two-year period is in existence. Presumably the two-year period furthers the interests of justice in these states. Why should such a period defeat justice in Minnesota?

Minnesota is one of only five of the forty-eight states of the Union in which the six-year statute applies. Some states have laws specifying the limitation for malpractice suits. Not so in Minnesota. In an editorial which appeared in MINNESOTA MEDICINE in February, 1921, it was pointed out that action for "libel, slander, assault, battery, false imprisonment or other tort resulting in personal injury" must be commenced within two years after the accrual of the cause of action. By another section of the statutes it is provided that actions for "criminal conversation or any other injury to a person or right of action not arising on contract and not hereinafter enumerated" shall be commenced within six years. Some years ago our Supreme Court decreed that actions for personal injuries founded on negligence are governed by the six-year and not the two-year limitation. Malpractice coming under the head of negligence has therefore been construed to come under the six-year limit.

It is difficult to imagine a case with just grounds for malpractice suit in which the condition would not be manifest within two years. Defense of a suit in which services were rendered over two years previous is most difficult. Witnesses in the way of

nurses and other patients are often difficult to locate and the memory of man is less exact the longer the period elapsed.

Members of the medical profession in Minnesota should make a special effort at this particular time to point out to their representatives the injustice of the present situation. Our Legislative Committee is doing its utmost, but only through the concerted action of the profession at large will the legislature be induced to make this much needed change in our statutes.

MISCELLANEOUS

THE PLANS OF THE MEDICAL SCHOOL OF THE UNIVERSITY OF MINNESOTA

E. P. LYON, DEAN

The modern medical school is the result of an evolutionary process extending back more than two centuries. In Germany it grew naturally out of the medieval university by the addition of hospitals and clinics. In England it grew by the addition of laboratories and faculties to long existing hospitals. In America this ideal developed from a rank growth of proprietary schools by an outburst of evolutionary energy supplied largely, during the last twenty years, by the American Medical Association through its Council on Medical Education. In each country the ideal now aimed at by all schools is substantially the same.

This ideal is composed of the following elements:

1. A faculty composed of competent scientists and practical teachers. Some of these, since the thing to be taught is an art as well as a science, should be active practitioners of the art. Others should be men who add to the fund of existing knowledge—research men or productive scholars—in order that the spirit of investigation and discovery may permeate the undergraduate teaching, and in order that graduate students who will be medical teachers later on may receive guidance and inspiration. With the need of a faculty goes the need of adequate support for the faculty.

2. A medical school must have a student body of selected, intelligent men and women, sufficiently old to be able to appreciate the difficult material of which the medical curriculum is composed; sufficiently young to exhibit spontaneity and enthusiasm; sufficiently trained in science to go forward without stumbling; sufficiently broad in culture to appreciate the many-sided interests of their chosen profession. The task of formulating the premedical curriculum is a very difficult one, involving many compromises. The time element has probably been stabilized as the gymnasium course of Europe or two years of college work in America. The best content of the course is perhaps not yet determined.

3. The modern medical school needs teaching and research laboratories for the preclinical sciences and for the clinical departments. The ideal involves well equipped laboratories for general, undergraduate instruction, advanced and special laboratories for graduate instruction and

for optional or elective courses, and finally research laboratories for the staff and advanced students. These laboratories must be supplied with the materials necessary for work and with technical and service help.

4. The medical school needs sick people. This means a hospital and an out-patient department. The patients must be used for teaching, and teaching equipment must be at hand. This means, for the best results, that this hospital and dispensary be owned and managed by the school. The number of patients must be sufficient, at least, to illustrate and furnish experience in the common diseases and the common methods of diagnosis and treatment. This means a general hospital of some size. The number of controlled beds usually considered adequate for a student body of one hundred to the class is 500 to 700.

I am here speaking of a hospital where cases can be kept as long as need be for teaching purposes, and where students may spend much time in the study of cases under instructors who are paid to give corresponding time,—a hospital, in other words, which is primarily an educational institution. Other hospitals not controlled or managed by the school but where good medicine is practiced, form useful auxiliaries.

5. A good medical school must have a Public Health department or be so definitely integrated with public health activities that the preventive side of medicine can receive adequate emphasis.

6. The medical school needs an ample library and funds for its support.

7. A first class medical school must have a graduate department, which serves, alike, for the training of future medical teachers, for the training of practitioners in the various specialties, for the promotion of research and—not by any means least—for the reflex effect of advanced work on the undergraduate student body.

All of these elements have come into the requirements of an ideal school because of changing ideals as to methods of medical teaching and learning. The ideal of the medieval university was learning *by hearing*. This ideal survived a long time in America. Many present practitioners were taught chiefly by the lecture method. The ideal of Billroth, fifty years ago, was learning *by seeing* as well as hearing. The amphitheater clinic was the climax of this ideal. The present day ideal is learning *by doing under proper supervision*, as well as hearing and seeing. The student laboratory course, the clerkship, small section clinic and internship are the outcome of this ideal.

The University of Minnesota Medical School is a good school, but it does not yet reach the ideals just sketched. It has definite plans by the fulfillment of which it can approximate these ideals. This article deals with these plans only in so far as they concern buildings, equipment and material resources.

The plan of our Medical School is to have eventually a hospital of 575 beds. It will be a general hospital representing all branches of medicine, surgery and obstetrics. It will be chiefly a free hospital supported by the state and counties for indigent citizens. It will be a pay hospital only to the extent that may be involved in the terms of gifts or that may be necessary to attract the right kind of clinical teachers.

With the completion of the Todd and Cancer pavilions now building, the University Hospital will have about 300 beds. The plan therefore involves the addition of 275 more beds. In these is included a forty-bed Psychopathic Hospital, which has been asked for as a separate item from the last two legislatures, and is greatly needed as a service institution in this state. Also in the 575 beds is included an acute orthopedic unit to go on the campus as part of the greater establishment for crippled children, made possible by the magnificent gifts of William Eustis.

When the University Hospital is expanded the administrative and service facilities must also be expanded. The plans include an administration building and an addition to the service building.

The school has a well-attended dispensary, but it is in temporary and unsatisfactory quarters. The plan calls for a dispensary building to house this very important part of the work of medical teaching.

The school has two laboratory buildings, but neither is complete. The plan includes the building of the lacking wings of Millard Hall and the Institute of Anatomy. It may be added that there is great need of these additions now, for in the last few years the student body has more than doubled, two important departments formerly housed elsewhere have been placed in these buildings, the dispensary has been brought from an old building across the river to the basement of Millard Hall, and space has been found also for a new department, that of Preventive Medicine and Public Health. The present laboratories are all overcrowded.

The school must have a nurses' building, and this is an important item of our plan. At present the nurses are living in old houses and flat buildings, part of which have to be rented by the University. The health and efficiency of the nurses demand better housing.

The school needs a larger library. Since the plan was formulated, the medical library has been adequately housed in the new Library Building, which is a credit to the University and to the State of Minnesota. But we need money for books, sets of periodicals and journals.

The present departments need equipment and the proposed additions will need equipment. The plan includes items for these necessities and for clinical laboratories.

All the foregoing the Medical School of the University of Minnesota needs to fulfill the universally accepted standard or ideal of a first class school; or—if you prefer a material illustration—to make this school the equal of Michigan or Iowa, or any of the leading medical schools of the country.

But the situation of this school is unique and the time is unique. Foresight and wisdom have presented the opportunity to make here a school of super-ideals.

The City of Minneapolis must eventually have a new city hospital. The present city hospital has for many years furnished valuable teaching opportunities to the Medical School, as has also the Ancker Hospital of St. Paul. In both cases the work has been handicapped by distance.

It is time now to take a long look into the future. It is time to think of what Minnesota will be medically one hundred years hence.

If the proposed new hospital of the City of Minneapolis should be located at a considerable distance from the University, its capabilities as a teaching and research institution would be permanently diminished. They might even be largely lost. On the other hand if this hospital could be placed near the University Hospital, its value as a center of teaching and medical science would be forever conserved and might increase as time goes on.

Medical men need not be reminded of the advantages to both undergraduate and postgraduate teaching accruing from the proximity of such a city hospital to the state hospital. Not only would the added beds furnish a greater variety and number of cases, but a municipal hospital will always present more acute diseases, accident and emergency conditions, contagious diseases and obstetric cases than a hospital drawing from the state at large.

Teaching and research contribute to the understanding and care of patients. Therefore that vital matter is tied up with the question of location of this hospital.

It is *not* the plan of the University to build the city hospital, support the city hospital, manage the city hospital, control the city hospital, or in any way change existing arrangements.

It is the plan of the University to conserve and perpetuate the scientific and teaching values of the city hospital by furnishing a site for that hospital near the medical school. The University believes that such a location would contribute alike to the welfare of the Medical School and the welfare of the City Hospital. It believes that such a geographical concentration of material, facilities and personnel would make Minnesota an important clinical center.

These are the plans of the University for the completion of an adequate physical plant for the Medical School and the conservation of the teaching opportunities of the community.

The estimated costs amount to \$3,600,000.

Does this seem a large plan? Does it, perchance, appear to some readers as unnecessarily large and expensive?

It was to anticipate such questions that I introduced this article with a statement of the present day ideals of a medical school and of the educational ideals which underlie such a school. But perhaps some comparisons may make the subject clearer.

The University of Iowa is spending just now the sum of \$4,500,000 on its medical school, as additions to considerable facilities already existing. The University of Michigan, at a cost, I am told, of \$5,000,000, has built an 800-bed hospital on foundations planned eventually to carry 1,200 beds. That University is now planning extensive new laboratories which will cost a large sum.

Columbia University has issued a prospectus concerning the new medical school and Presbyterian Hospital and states that the first unit of the medical center, as planned, will cost \$10,000,000.

Other examples could be cited, but the above are sufficient to show that our plans are not extravagant.

There are three thoughts to keep in mind in this connection:

1. The method of teaching by lectures seemed cheap, while the method of teaching by doing under supervision seems expensive. It seems expensive because it demands a large clinical material accumulated in one place. But bear in mind that no one ever learned any art except by doing. Under the former cheap form of medical education the graduate had to learn by doing after he got out into practice, there was no supervision, and the public had to pay the bill in more ways than one. The new plan costs no more in the aggregate, and the results are better both for medical education and for the public welfare.

2. The University Hospital seems a very expensive educational establishment. While erected and maintained, from our standpoint, for educational purposes, it has nevertheless a by-product in service rendered which is worth the cost. The poor and unfortunate must be cared for in any case. Before there was a University Hospital counties sent patients to other hospitals and paid the bills. Again, while the cost seems high, it is because it is concentrated where you can see and count it. The by-product justifies the whole bill and the by-product costs no more than equal scattered service would cost.

3. The University does not expect to realize its plans immediately—in fact does not desire to realize them too rapidly. It wishes to look ahead to something symmetrical and adequate. But it expects ten or more years to elapse before the entire plan is realized, hence the costs will be distributed over a long time.

Bear these thoughts in mind as you consider the remainder of this paper.

The foregoing plans and the estimate, with the formal approval of the Board of Regents of the University, were presented by President Coffman to the Rockefeller Foundation and the General Education Board of New York. These organizations sent special investigators to go into all questions involved. Acting upon the advice of these investigators the trustees of these foundations approved the plans. The Rockefeller Foundation found itself unable to participate; and by arrangement between the two organizations, the General Education Board took over the entire project and now offers to the University of Minnesota the sum of \$1,250,000 toward the realization of the University's plans for medical education, on condition that the University, from public or private sources or both, shall raise the balance of \$2,350,000. This is in keeping with the present policy of the Rockefeller Boards to finance to the extent of one-third the projects they go into.

There is no other condition whatsoever attached to this offer.

The goal is in sight. If the medical men of the state act strongly and unitedly they can push through to a great victory, and it will be their victory, that of their profession—their heritage and that of their descendants.

Let me ask what the manufacturers and merchants would do if it was proposed to erect a factory costing \$3,600,000. What the factory would be to business interests, an adequate medical teaching and research center in the Northwest would be to the practitioners of medicine.

The plan lends itself admirably to donations for memorial purposes. The nurses' home, the children's pavilion, the

women's hospital, the infirmary, the clinical laboratories, solaria, wards, rooms, beds—any or all might bear the names of donors or the names of those whom such donors wished to honor. The medical profession can help by presenting this idea wherever possible, particularly from the standpoint of the service to be rendered the sick and unfortunate.

The state and citizens need to catch a vision of values alike in health, education and prestige to be realized in these plans. The medical profession can further the plans by telling the people of the advantages to be gained.

The united support of the medical profession will "put the ball over."

OBITUARY

DR. CHELSEA C. PRATT

Dr. Chelsea Carroll Pratt, of Mankato, died at his home Saturday, December 20, 1924.

Dr. Pratt was born in Chippewa Falls, Wisconsin, in 1877. He received his degree in Medicine from the University of Minnesota in 1905 and served on the faculty of that institution for a time. He was later a member of the faculty of the University of North Dakota. He had been a member of the Mankato Clinic for a number of years preceding his death. During the World War, Dr. Pratt served in France and Montenegro.

Surviving are his widow, two sons, his mother, sister and brothers.

The esteem in which Dr. Pratt was held among his fellow practitioners is well acknowledged in the following memorial:

IN MEMORIAM

DR. CHELSEA C. PRATT

We bow in humble submission to the will of the Divine Creator in removing from us by death our esteemed friend and fellow worker, Dr. Chelsea C. Pratt; yet we mourn the fact that he was stricken down in the zenith of a life of activity and usefulness. Therefore, be it resolved by Blue Earth County Medical Society in regular session assembled:

1. That we deeply regret his demise, and shall miss his genial fellowship, his efficient work amongst us, his ethical character and untiring zeal for the good of the profession.

2. That we extol and honor his memory for his unflinching devotion to duty in the service of his country in time of national stress, and for the remarkable courage and cheerful spirit which he revealed during his last illness, even though he was fully aware of its hopelessness.

3. That we express to the bereaved family our condolence and sympathy.

4. That a copy of these resolutions be spread upon the minutes of our society, that a copy be sent to the family and one to each of the state medical journals.

J. W. ANDREWS,

H. J. LLOYD,

A. V. DENMAN.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

A joint meeting of the Section on Surgery and the Section on Medicine of the Minnesota State Medical Association with members from the Hennepin County Medical Society was held in Minneapolis, January 10th, to consider arrangements for the program of the annual meeting, April 27th, 28th and 29th.

Dr. L. A. Rowntree, Rochester, chairman of the Section on Medicine, Dr. Harry P. Ritchie, Saint Paul, chairman of the Section on Surgery, and the Hennepin County Medical Society represented by Drs. W. A. Jones, A. S. Hamilton, C. B. Wright and N. O. Pearce, were present.

Indications are that this meeting will be one of unusual interest. It was agreed to commence the meetings at 8:00 o'clock A. M. and 2:00 o'clock P. M., and that they be held at the University of Minnesota.

The Clinical Section of the Hennepin County Medical Society generously offered to provide all clinical material for this meeting. This is the time that clinical week is usually held in Minneapolis.

Dr. Wm. David Haggard, president of the American Medical Association, Dr. Frank Billings, and Dr. Wm. C. Woodward are to be invited as speakers and guests.

Monday evening will be devoted to the consideration of medical economic subjects. The visiting guests will be speakers. Tuesday morning is to be devoted to clinical demonstrations of lymph nodes, tumors of the breast and bones. Wednesday morning another joint clinical meeting will be held on diseases of the glands of internal secretion and neurology.

The two afternoons are to be devoted to papers. Invitations will be extended for papers on a few selected subjects. It is requested that all those desiring to present papers before this meeting turn them in immediately to the chairmen of their respective sections.

CLINIC TOUR OF THE INTER-STATE POST-GRADUATE ASSEMBLY

Last year members of the American Bar took a trip abroad and this year a somewhat similar voyage is to be made by physicians under the direction of the Managing Director's office of this very live association with headquarters at Freeport, Illinois.

The only qualification required is membership in a State or Provincial society. The family of such a physician is eligible. Clinics in all the specialties are to be offered this group of American doctors at numerous medical centers in Canada, England and France. Extension tours to the principal medical centers in Europe may be arranged in addition.

The tour starts from Chicago, May 17th, and the first clinics are scheduled for Toronto May 18th and 19th. The Toronto clinics will be conducted by the medical faculty of

the Toronto University and in Montreal by the McGill faculty.

Sailing from Montreal a professional program conducted by some of the foremost men of the profession is being arranged while on the water. Landing in Liverpool May 31st, the first week in June will be spent at the various hospitals in London.

Numerous social functions in the form of receptions and luncheons will be given the visiting physicians by the Lord Mayor of London and the presidents of the Royal Societies of Medicine and Surgery, among others. Intensive professional programs will be carried on while in London.

The tour will include Liverpool, Manchester, Leeds, Dublin, Belfast, Glasgow, Edinburgh, Newcastle. The week of June 22nd to 27th will be spent in Paris. The clinics in Paris are to be arranged by some of the most eminent members of the profession in that city and receptions will be given the visitors by the Academy of Medicine and the Municipal Council of Paris.

The party will return to this country after the week in Paris. Prices for the tour as outlined vary from \$635 to \$990 per individual depending on accommodations preferred. Here is an opportunity to visit some of the well known medical centers in professional company and with plenty of pleasant relaxation interspersed. Regular tour arrangements care for the bothersome details.

For further information and reservations, write Dr. W. B. Peck, Freeport, Illinois.

LYMANHURST AND PARKVIEW STAFF MEETING

The following program will be presented before the regular meeting of the Consulting Medical Staff of the Lymanhurst School for Tuberculous Children at 7:00 o'clock, Tuesday evening, February 24, in the Lymanhurst School, 1800 Chicago Avenue, Minneapolis:

"Types of Tuberculosis Causing Death in Minnesota Children"Dr. Ruth Boynton
 "Genital Tuberculosis".....Dr. F. L. Adair
 "Further Studies on the Height, Weight and Ponderal Index in Suspected Tuberculous Children"
Dr. R. E. Scammon

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

FREEBORN COUNTY MEDICAL SOCIETY

The annual meeting of the Freeborn County Medical Society was held at Albert Lea, Wednesday, December 17. The following officers were elected for the coming year: President, Dr. J. P. Von Berg, Albert Lea; vice-president, Dr. W. L. Palmer, Albert Lea; secretary, Dr. J. W. Gamble, Albert Lea, and treasurer, Dr. J. R. Nannestad, Albert Lea.

A round table discussion was engaged in by all members of the Society present. Plans for special programs to be given during 1925 are being made under the direction of Dr. W. I. King and Dr. H. D. Burns, both of Albert Lea, who were appointed as the committee in charge of arrangements.

OF GENERAL INTEREST

Dr. G. H. Wahle, of the Mayo Clinic, Rochester, has moved to Boise, Idaho.

Dr. John H. Stokes, of the Mayo Clinic, Rochester, is now located in Philadelphia.

Dr. F. P. Frisch, of Richmond, is engaged in post-graduate work in New York City.

Dr. E. L. Bradley, formerly of Duluth, is now practicing his profession in Superior, Wisconsin.

Dr. Bernt O. Odegaard has moved his practice from Emmons, Minnesota, to Northwood, N. D.

Dr. D. R. Campbell, formerly of Bagley, is now located at 630 Langdon Street, Madison, Wisconsin.

Dr. G. A. Eisengraeber, of Granite Falls, is now in Los Angeles, where he will spend several months.

Dr. Henry Odland, formerly located in Minneapolis, is now practicing medicine in Seattle, Washington.

Dr. Laura A. Lane, formerly of Minneapolis, is now associated with the Philadelphia General Hospital, Philadelphia, Pa.

Dr. Albert S. Crawford, formerly of the Mayo Clinic, Rochester, has located for the practice of his profession in Madison, Wisconsin.

The fourteen year old son of Dr. J. T. Holcomb, St. Paul, was killed accidentally Saturday, January 17, 1925, when he was run over by a truck.

Dr. and Mrs. C. Eugene Riggs, of St. Paul, left January 15 for Orlando, Florida, where they will spend the winter months. They expect to return to St. Paul some time in April.

Dr. and Mrs. F. R. Woodard, Minneapolis, left the latter part of January for California, where they plan to spend eight weeks. They will be in Long Beach and Pasadena the greater part of the time.

Dr. and Mrs. Arthur Sweeney, of St. Paul, and their daughter, Miss Josephine Sweeney, left for Miami, Florida, in January. Dr. Sweeney will return to his practice after a short visit. Mrs. Sweeney and Miss Sweeney will remain in Florida for the winter.

Dr. and Mrs. Thomas A. Peppard, Minneapolis, who have been traveling abroad for several months, returned in January. They had planned to spend several months in Europe but were called home suddenly on account of the serious illness of Mrs. Peppard's mother.

Notice has been received of the death on December 10, 1924, of Dr. John Hunter, of Sydney, Australia. In company with Dr. N. D. Royle, he came to America at the invitation of Dr. William J. Mayo and Dr. Franklin H. Martin to deliver the John B. Murphy oration in surgery at the meeting of the clinical Congress of the American College of Surgeons, held in New York in October, 1924. The work of Dr. Hunter and Dr. Royle in connection with spastic paralysis has created unusual interest in the medical world.

After leaving New York Dr. Hunter went to London,

where he was very active demonstrating some of his work. Early in December he was taken ill with typhoid fever while in Cambridge and returning to London became very ill and died December 10th.

The Health Committee of the League of Nations is planning a method of international standardization of anti-toxins and serums. In the past the hospital statistics of London, Berlin and Paris have been of little use to the American practitioners as every country has a different standardization.

At the meeting of the Minnesota Pathological Society held at the Institute of Anatomy, University of Minnesota, January 20, Dr. A. T. Henrici presented a paper on "Morphologic Changes and Rate of Growth of Bacteria." Dr. A. A. Zierold presented the subject of "Bursitis" and Dr. William A. O'Brien gave a case report.

The commission for the distribution of the prize for cancer study founded by Dr. Sofie A. Nordoff-Jung, in agreement with the foundress, has resolved to distribute the prize from now on only every two years to the double amount of the sum allotted heretofore, that is one thousand dollars. The next prize will reach distribution in 1926.

Dr. C. F. Ewing, of Wheaton, is recovering from an automobile accident in which he was injured about the head and body, suffering several broken ribs. The accident occurred when Dr. Ewing was returning from a call in the country. His automobile sideswiped a freight locomotive at a grade crossing and was dragged for some distance before the locomotive could be stopped.

The Medical School of the University of Minnesota announces a short course in Physiotherapy to be conducted at the University by Dr. F. B. Granger, of the Harvard Medical School, during the week of February 9, 1925. Special attention will be given to Electrotherapy, with the theory and practical application of such modalities as the Galvanic Sinusoidal, Faradic, and Static currents and also the Ultra-violet rays.

Furnishing of nine of the nineteen rooms in the new addition to the Red Wing Hospital, Red Wing, Minnesota, has been arranged for by organizations and individuals. Among those who will furnish rooms are the United Commercial Travelers, Kiwanis Club, Modern Woodmen of America, Mrs. Herbert Simmons Brown, of Portland, Me., Mrs. C. E. Friedrich and Miss Helen Friedrich, Mr. and Mrs. C. J. Sargent, the Junior Guild of Christ Church of Red Wing, American Legion and the Ladies' Aid of the First M. E. Church.

The following items regarding the smallpox situation in the Twin Cities will be of interest to our readers:

From January 1, 1924, until January 16, 1925, there occurred 268 deaths from smallpox in Minneapolis, thirty-nine of these deaths having occurred since January 1, 1925. During the same period a total of twenty deaths have occurred in St. Paul, three of which have occurred since the first of this year. Although there has not been a great difference in the actual number of cases of smallpox which have occurred since January 1, 1924, the difference in virulence of the epidemic is shown by the above figures.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

ABBOTT LABORATORIES:

Tablets Benzyl Fumarate-Abbott, 5 grains.

GILLILAND LABORATORIES:

Diphtheria Toxin Antitoxin Mixture, 0.1 L+.

HYNSON, WESTCOTT AND DUNNING:

Sealed Tubes Mercurochrome-220 Soluble, 0.5 gm.

LEDERLE ANTITOXIN LABORATORIES:

Intracutaneous Tuberculin for the Mantoux Test.

LEHN AND FINK:

Corpus Luteum-L. and F. Desiccated:

Capsules Corpus Luteum-L. and F. Desiccated, 2 grains.

Capsules Corpus Luteum-L. and F. Desiccated, 5 grains.

Tablets Corpus Luteum-L. and F. Desiccated, 2 grains.

Tablets Corpus Luteum-L. and F. Desiccated, 3 grains.

Ovarian Residue-L. and F. Desiccated:

Capsules Ovarian Residue-L. and F. Desiccated, 5 grains.

Tablets Ovarian Residue-L. and F. Desiccated, 2 grains.

Tablets Ovarian Residue-L. and F. Desiccated, 5 grains.

Ovarian Substance-L. and F. Desiccated:

Capsules Ovarian Substance-L. and F. Desiccated, 2 grains.

Capsules Ovarian Substance-L. and F. Desiccated, 5 grains.

Tablets Ovarian Substance-L. and F. Desiccated, 2 grains.

Tablets Ovarian Substance-L. and F. Desiccated, 5 grains.

MALLINCKRODT CHEMICAL WORKS:

Mallinckrodt Tetrabromphenolphthalein Sodium Salt.

Mallinckrodt Tetrabromphenolphthalein Sodium Salt, 5 gm. ampules.

H. K. MULFORD CO.:

Neorobin.

Vacuum Sealed Tubes Neorobin, 1 grain.

Vacuum Sealed Tubes Neorobin, 5 grains.

NEW YORK QUININE AND CHEMICAL WORKS:

Euquinine-N. Y. Q.

E. R. SQUIBB AND SONS:

Bacillus Bulgaricus-Squibb.

NON-PROPRIETARY ARTICLE:

Tetrabromphenolphthalein Sodium.

Iletin (Insulin-Lilly) U-80.—Five c.c. ampules containing 80 units of iletin (insulin-Lilly) (New and Non-official Remedies, 1924, p. 152) in each c.c. Eli Lilly and Co., Indianapolis.

Ampules Adrenalin Chloride Solution Rx 1, 1:1000, 1 c.c.—A solution of adrenalin chloride (New and Non-official Remedies, 1924, p. 117), one part in physiological solution of sodium chloride, 10,000 parts without preservative. Parke, Davis and Co., Detroit.

Ampules Adrenalin Chloride Solution Rx, 1:2600, 1 c.c.—A solution of adrenalin chloride (New and Non-official Remedies, 1924, p. 117), one part in physiological solution of sodium chloride, 2,600 parts without preservative. Parke, Davis and Co., Detroit.

Ampules Adrenalin Chloride Solution, 1:1000, 1 c.c.—A solution of adrenalin chloride (New and Non-official Remedies, 1924, p. 117), one part in physiological solution of sodium chloride, 1,000 parts without preservative. Parke, Davis and Co., Detroit.

Benzyl Succinate-Merck.—A brand of benzyl succinate N.N.R. For a discussion of the actions and uses of benzyl compounds, see Journal A. M. A., Dec. 6, 1924, p. 1864. Merck and Co., New York.

Thigenol.—Solution Sodium Sulpho-Oleate-Roche. —A solution of the sodium salts of synthetic sulpho-oleic acid containing 2.85 per cent of sulphur. Thigenol has the actions and uses of sulphoichthyolate preparations (New and Non-official Remedies, 1924, p. 350). The Hoffmann-La Roche Chemical Works, New York.

Sterile Ampules Mercuric Potassium Iodide, 0.017 gm. (1/4 grain).—A solution of potassium mercuric iodide obtained by dissolving red mercuric iodide 0.01 gm., and potassium iodide, 0.01 gm. in water, 1 c.c. Swan-Myers Co., Indianapolis. (Journal A. M. A., Dec. 6, 1924, p. 1847.)

Ergotole.—Extractum Ergotæ Liquidum.—A liquid extract of ergot containing 19 per cent of alcohol. It is standardized on the uterus of the virgin guinea-pig so that a 1:2,500 dilution of ergotole has the same activity as a 1:20,000,000 solution of beta-aminazolyethylamine hydrochloride. The actions and uses of ergotole are the same as those of ergot. Ergotole is also marketed in ampules containing 1 c.c. Sharp and Dohme, Baltimore.

Hypodermic Tablets Strophanthin 1/100 grain-Lilly.—Each tablet contains strophanthin U.S.P. 1/100 grain. Eli Lilly and Co., Indianapolis.

Hypodermic Tablets Strophanthin 1/120 grain-Lilly.—Each tablet contains strophanthin U.S.P. 1/120 grain. Eli Lilly and Co., Indianapolis.

Hypodermic Tablets Strophanthin 1/200 grain-S. and D.—Each tablet contains strophanthin U.S.P. 1/200 grain (0.325). Sharp and Dohme, Baltimore.

Ampules Ouabain 0.0003 gm. (1/128 grain)-Lilly.—Each ampule contains ouabain crystallized-N.N.R., 0.0005 gm. in 2 c.c. of a buffered, sterile normal salt solution. Eli Lilly and Co., Indianapolis.

Compressible Capsules Mercury Salicylate "Synthetic," 1 grain for Intramuscular Injection.—Mercuric salicylate 0.065 gm. (1 grain) suspended in 1 c.c. of a mixture of benzoinated lard, 67 per cent; peach kernel oil, 31 per cent; camphor, 1 per cent; phenol, 1 per cent. Synthetic Drug Co., Toronto, Canada.

Compressible Capsules Mercury Salicylate "Synthetic," 1 1/2 grain for Intramuscular Injection.—Mercuric salicy-

late 0.1 gm. (1½ grain) suspended in 1 c.c. of a mixture of benzoinated lard, 67 per cent; peach kernel oil, 31 per cent; camphor, 1 per cent; phenol, 1 per cent. Synthetic Drug Co., Toronto, Canada.

Compressible Capsules Mercury Salicylate "Synthetic," 2 grains for Intramuscular Injection.—Mercuric salicylate 0.13 gm. (2 grains) suspended in a mixture composed of benzoinated lard, 67 per cent; peach kernel oil, 31 per cent; camphor, 1 per cent; phenol, 1 per cent. Synthetic Drug Co., Toronto, Canada. (Journal A. M. A., Dec. 13, 1924, p. 1923.)

Novasurol.—The double salt of sodium mercurichlorophenyloxyacetate with barbital. Novasurol contains 33.9 per cent of mercury. Novasurol is used chiefly as a diuretic. It has the advantage over mild mercurous chloride and other insoluble mercury compounds in that it is soluble and may be administered by intramuscular and intravenous injection. The best results have been obtained in dropsies due to cardiac disease. Some authors hold that soluble mercury compounds should be used for their diuretic action, only as a last resort when other drugs have failed. As an antisymphilitic, novasurol has generally been injected intravenously mixed with one of the arsphenamines. Novasurol is supplied in ampules containing 1.2 c.c. of a 10 per cent solution. Winthrop Chemical Co., New York.

Euquinine-N.Y.Q.—A brand of quinine ethylcarbonate. (For a discussion of the actions, uses and dosage of quinine ethylcarbonate, see New and Non-official Remedies, 1924, p. 267.) New York Quinine and Chemical Works, New York. (Journal A. M. A., Dec. 20, 1924, p. 2019.)

Tetrabromphenolphthalein Sodium.—The sodium salt of a dibasic dye, tetrabromphenolphthalein. Tetrabromphenolphthalein sodium is used for the roentgenologic examination of the gall bladder. Following intravenous injection the substance appears in the gall bladder in sufficient concentration to cast a shadow to the roentgen ray. After injection, some of the patients may have unpleasant symptoms such as dizziness, nausea, various body pains, and fall in blood pressure. The use of tetrabromphenolphthalein sodium is still in the experimental stage and workers are cautioned as to the selection of types of cases in which it is indicated and its possible toxicity in large doses. To visualize the gall bladder, 4.5 to 5 gm. is sufficient for a patient weighing 125 pounds or more, and should be reduced for patients weighing less. (Journal A. M. A., Dec. 27, 1924, p. 2095.)

BLACK HAIR DYE

No black hair dye can be considered safe and not injurious. Every chemical used for dyeing the hair black is a potential trouble-maker. Some individuals who are not sensitized, may even use paraphenyldiamin for long periods without causing any disturbance, whereas others cannot use silver nitrate or pyrogalllic acid. These facts should be given to the public and the user should assume the responsibility for the dermatitis which may follow. A person's sensitiveness to a given dye may be determined by its application to a covered portion of the body. (Journal A. M. A., Dec. 13, 1924, p. 1943.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

MEETING OF DEC. 10, 1924

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 10, 1924, at 8 o'clock. The meeting was called to order by the Vice President, Dr. Ulrich. There were 36 members and 2 visitors present.

The minutes of the November meeting were read and approved.

Dr. Gustav Schwyzer presented a specimen of goiter.

DR. CARL B. DRAKE (St. Paul) then read his thesis, entitled "The Clinical Significance of Glycosuria." (Publication will follow later.)

DR. E. J. SIMONS read a paper entitled "Observations on Blood Pressure During Pregnancy, Labor, and the Puerperium," by Drs. F. L. Adair and E. J. Simons. (This paper together with the discussion will be published in a later issue of MINNESOTA MEDICINE.)

The meeting adjourned.

JOHN E. HYNES, M.D.,
Secretary.

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

The regular meeting of the Minneapolis Surgical Society was held at the Y. M. C. A., November 6, 1924. Following the dinner at 6:30, the meeting was opened by the new president, Dr. A. E. Wilcox, who presented his presidential address.

ADDRESS TO THE MINNEAPOLIS SURGICAL SOCIETY

BY THE PRESIDENT, DR. ARCH A. E. WILCOX

The Minneapolis Surgical Society has paid me a high compliment by electing me its president. The two successful years of the Society's existence, the character of its programs, and the interesting discussions held at its regular meetings are sufficient evidence upon which to base a most favorable prophecy as to its future growth and expansion.

At this time permit me to express my appreciation of the compliment you have paid me, and, in addition, to inform you that I am conscious of the great responsibility which goes hand in hand with the honor which you have so generously bestowed upon me.

It is not my intention in making this address, much as I would like, to attempt to leave in the archives of the

Society a gem of literary construction, nor shall I endeavor to flavor my message with rhetorical passages or submerge its real meaning by outbursts of oratorical high lights, for, in the first place, it would be a waste of the Society's time, and obviously no other reason under the present circumstances should be given any consideration.

The originators of this Society are still among the younger members of the profession and they are to be heartily congratulated upon the success with which they have met and overcome the difficulties of organization. They and the present members of this Society, have, by a genial and co-operative spirit, not only brought into existence a new and useful organization, but by continued united effort and careful thought are destined to develop a force in our profession which will reflect credit to its members and ultimate good throughout the community.

Nearly twenty years ago an attempt was made by a few of the younger members of the profession to organize a surgical society in this locality, but the seeds planted by these young pioneer horticulturists did not seem indigenous to the soil. Either the weather was too severe for successful propagation of the germinal ideas, or uncontrollable storms uprooted the unprotected sprouts, or careless heels crushed out the life of the unfolding buds, and the land lay waste; but now, through your efforts, the soil is broken, the ground fertilized, the crop in sight and it is up to all of us what the harvest will be.

For the coming year I have the three following suggestions to make, which I trust you will give some consideration and discussion;

1. In addition to our regular programs, which have usually consisted of the reading of one or more scientific papers, or presentation of cases, that part of the time or an additional twenty minutes or half hour at each meeting be devoted to listening to various members—previously appointed by the program committee—reading short reviews, epitomized reports or comments on current medical literature which would likely be of interest and value to the Society.

In doing this, many articles which might otherwise easily escape notice will be brought to the attention of the entire Society and much time saved in individual reading.

I would suggest, therefore, that a certain period be given over to the review of current surgical literature, the member preparing a concise short talk of five minutes—presenting only the best in the journals selected.

2. A most important responsibility of every member of this Society is the proper recording of his cases. The American College of Surgeons has emphasized this and in the standardization of hospitals you are all familiar with the requirements set forth by that organization.

Equally important, and yet much neglected by the majority of surgeons, is a proper follow-up system of cases, for only by the end results can any method of procedure be carefully weighed and facts separated from fads.

I would suggest that after careful discussion a standardized method for the following up of cases be adopted by members of this Society and put into effect as soon as possible, and that at the termination of a certain period

the members report jointly on the end results of certain procedures.

A committee could be appointed to formulate some simple yet efficient method and present same to the Society for adoption.

3. It seems that daily the cancer problem becomes of more importance. Dr. John Clark says in his review, "Although no startling facts have been determined relative to the etiology of cancer, research workers are not discouraged; in fact, there is probably more scientific investigation into the mysteries of cancer being carried on at present than at any time in the past."

You are all familiar with the interesting and untiring efforts of Bloodgood, and while he is being supported by a host of friends, contributors, and former patients, it is due largely to his individual efforts that much valuable information regarding cancer is being collected.

Our own University in Minnesota is building, through the beneficent gift of the Christian family, another research unit, and we especially, as a surgical society, should give it every support possible,—reporting cases in detail, furnishing specimens and information in every way possible as well as placing our shoulders to the wheel of public education whenever the request is made. The value of education of the public regarding cancer, without any question, is beginning to be shown in recent statistics, particularly as regards early consultation, and cannot but help improve figures of ultimate results.

I would suggest that the new journal called "Cancer" be regularly reviewed in the current literature, and that the concentrated effort of this Society in every possible way manifest itself in co-operating with all research work, local and national, in an attempt to encourage these workers if not adding an atom of new knowledge toward helping in the control and cure of this dread disease.

Minneapolis, Oct. 9, 1924.

Dr. Martin Nordland read a paper on "Some Practical Points in Surgery of the Thyroid." (See page 104.)

DISCUSSION

Dr. R. E. Farr opened the discussion. He stated that he wished to congratulate Dr. Nordland on the paper. The classification as given by Dr. Nordland was a little different than ordinary classifications, but it is one recently used by surgeons. Dr. Farr spoke of the advisability of ligating the inferior as well as the superior thyroid in preparing exophthalmic patients for their thyroidectomy. He called attention to the danger of giving iodine in certain cases, as it may activate a toxic goiter. As interesting points in the technique, Dr. Farr spoke of his effort in trying to meet psychic factors which might present. He disagreed somewhat with Dr. Nordland as to his method of anesthesia, stating that local anesthesia was merely one part in a scheme of handling patients with exophthalmic goiter. When a patient with a severe exophthalmic goiter comes to the hospital the effort is made to do everything possible to make the situation ideal. He keeps the patient in igno-

ance as to the details of the management, but he acquaints friends or relatives. He tells the patients that they are to be treated rather than operated upon. When the rapid pulse rate and other unfavorable signs have subsided the patient is taken to the operating room, where the room is arranged as for an operation. The neck is cleaned with alcohol and gentle manipulations about the neck are made and even sterile hypo may be given in the neck. The patient is then returned to her own room. Often such a procedure will cause a rapid pulse and a recurrence of the nervousness, etc., but as a rule she improves from this readily. She is taken to the operating room several times two or three days apart, depending on the reaction at the trips, until it is found that these trips do not cause a marked disturbance. Then upon one of these trips and before the patient realizes that she is being operated upon, the operation is nearly over and she escapes many of the untoward effects of the operation. In such a scheme it might be said that local anesthesia was perhaps 20 per cent and the general method 80 per cent. It is important to have someone at the head of the patient to help control her mental reaction and to encourage the patient. Dr. Farr refers to such an individual as a psychic anesthetist.

Another point he spoke of was when the incision is made through the skin and the platysma, if desired, the upper flap is undermined for perhaps 1.5 inches, the muscles are divided above the level of the skin incision, then the whole flap is raised upwards as far as needed to expose the gland; that is, the muscles are left in contact with the overlying tissues rather than to expose the outer surface for any length before dividing them.

In speaking of the scar, Dr. Farr mentioned the fact that after having discarded skin clips a few years ago he has begun using them again recently. One-half of the clips are removed on the day following the operation and the rest on the second day.

Dr. H. B. Sweetser spoke about the preoperative treatment of goiter patients. Simple goiter patients need no preoperative treatment. If an exophthalmic patient comes to the office during a crisis with a marked tremor, fast pulse, etc., and is operated upon, he will die. He should be sent to the hospital for preparation. Keep the patient from his friends and give him bromide, if necessary. He uses Lugol's solution, 10 mm. three times a day, and under such management it is the rule to notice a marked improvement. He has lost no goiter patients in about ten years. At the University Hospital he was shown one patient who had received 10 drops of Lugol's solution without improvement. He was transferred to another service and given 20 drops a day with a very marked improvement. The experience, Dr. Sweetser said, had stood him in good stead. He thinks that administration of Lugol's will make it unnecessary to ligate the superior thyroids in many cases.

In regard to x-ray and radium treatment, he has operated upon several cases where x-ray and radium had been used and a relapse had occurred within a few weeks. Concerning anesthesia, his method is to let the patient have a general anesthetic, nitrous oxide, if desired. He uses local whether or not gas is to be given. If after the incision is made the patient is restless, gas is given before the operation is completed. He said that he thinks it is advisable

to drain the patient for twenty-four hours after the operation. Crile gave statistics of a mortality of less than 1 per cent. Men who are careful do not operate on a patient with exophthalmic goiter the day after they see them.

He spoke of the importance of removing a portion of both lobes and stitching over the capsule afterwards. He seldom sees the recurrent laryngeal nerve. For many years he had a tracheotomy tube ready in case it should be needed, but he has not used one for so long that he is not sure it is always put in readiness.

Dr. Angus Cameron spoke about the administration of iodine. He stated that at the present time he has a girl seventeen years old in the University Hospital with exophthalmos. She was given Lugol's solution and was distinctly worse. She was ligated and was very much better. He does not doubt that this was a true exophthalmic goiter. He stated that the medical service was disappointed with the results obtained in exophthalmic goiters. He spoke of the difficulty of determining whether or not certain goiters are malignant. He told of a patient who had a discharging sinus who had been operated upon by a member of the surgical staff at the University Hospital. A section of the thyroid was removed and the pathologist made a diagnosis of malignancy. X-ray treatment was given. The patient returned in three years with symptoms of exophthalmos and was operated upon again, when it was found that the isthmus was the part most involved. This was removed and the section sent to the same pathologist, when a diagnosis of non-malignant goiter was made.

Dr. E. K. Green asked a question about the treatment of toxic adenomas. He said that while it was easy to know what to do with exophthalmic goiter the toxic adenomas offered the greatest problems in treatment.

Dr. J. M. Hayes discussed the paper in general.

Dr. Nordland closed the discussion and emphasized the importance of making a correct preoperative diagnosis. Many men who enjoyed good reputations merely told a patient that they had a goiter without, apparently, trying to distinguish the different types.

The meeting was adjourned.

WILLARD D. WHITE,
Secretary.

More Misbranded Nostrums. — The following products have been the subject of prosecution by the federal authorities charged with the enforcement of the Food and Drugs Act: Doane's Kidney Pills (Foster-Milburn Co.), consisting essentially of potassium nitrate, ground leaves of uva ursi, a trace of volatile oil such as turpentine or juniper oil, a resin, starch, sugar and talc. (For years the advertising of "Doane's Kidney Pills" has long been an offense against the public health. Its advertising methods have been such as to frighten the public into the belief that pain or soreness in the lumbar region is indicative of kidney disease.) Lafayette Headache Powders (Lafayette Co.), consisting essentially of acetanilid, daffein, sodium bicarbonate and aromatics, including cinnamon and ginger. Grogan Mineral Water (Grogan Wells and Boone Institute of Massage), containing large numbers of bacteria and gas-forming organisms, indicating that the water was polluted. (Jour. A. M. A., Aug. 23, 1924, p. 631.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

PNEUMONIA—DIAGNOSIS AND TREATMENT: David Riesman (Medical Clinics of North America, November, 1924). The article is the basis of a lecture on pneumonia at the University of Pennsylvania, and is abstracted chiefly because the data concerning pneumonia are concisely and systematically summarized.

During the past two years it has been determined that there is an atypical type of pneumococcus elaborating somewhat on the original classification of the four groups, which according to 454 cases from the Rockefeller Institute are of the following percentages in their incidence:

- Type I. 33 per cent.
- Type II. 29.3 per cent.
- Type II (atypical). 4.3 per cent.
- Type III. 13 per cent.
- Type IV. 20.3 per cent.

It was also noted that of 160 contacts with pneumonia patients, who themselves had not contracted the disease, 13 per cent showed either Type I or Type II pneumococcus, and of 297 non-contact controls only .3 of 1 per cent showed the pneumococcus.

Although pneumonia is frequently preceded by a slight cold, it is undoubted that in view of the pneumococcus' absence in the mouth in normal individuals it is transmitted by contact more frequently than is generally supposed, and the recent inauguration of compulsory quarantine in Pittsburgh is being watched with interest.

Considerable space is given to the differential diagnosis of pneumonia, and to the distinguishing features of pneumonia in children. He believes that the latter is a more common occurrence in children than the text-books ordinarily claim, and that the physical signs are frequently late in appearing. The high fever, leukocytosis and expiratory grunt are suggestive symptoms.

The various curative measures employed in pneumonia may be divided into:

- (a) Specific treatment
 - (b) General treatment
 - (c) The treatment of complications
- Under the specific treatment we have:
- (1) The use of serum from immunized animals
 - (2) Serum from convalescent pneumonia patients

- (3) Serum or blood from birds, chiefly chickens
- (4) The use of extracts of anti-bodies made from pneumococci themselves
- (5) Chemo-therapy

Of the sera from immunized animals the only one which has proved of value is the Type I serum, and even in this instance the mortality has not been reduced sufficiently to give such serum the rank of an ideal specific. In its use it must be given as early as possible, in large amounts, intravenously, with due caution relative to anaphylaxis and serum sickness.

The statistics based upon the treatment of pneumonia with the serum or blood from birds and the extracts of anti-bodies from pneumococci themselves are insufficient in number to warrant any definite conclusions.

Chemo-therapy with quinine and mercurochrome is not of certain value.

Stewart's report on the treatment of 12 cases of pneumonia with diathermy, with a mortality of 20 per cent, is too meagre to warrant any analysis. The general treatment is based on the copious administration of water, absolute rest, no sponging except in unusual cases, alkalization of the patient, a restricted diet, careful observation for beginning myocardial failure, and the treatment of definite distressing symptoms such as cyanosis, tympany, insomnia, and cough.

The writer believes that delayed resolution is due to a failure of proper liquefaction of the exudates through a lack of ferment or to an excess of anti-ferment; to empyema; abscess of the lungs; tuberculosis; pericarditis; syphilis; residual edema; and other complications of lesser moment, such as arthritis, middle ear disease and hepatitis.

DR. F. J. HIRSCHBOECK.

TOTAL PARALYSIS OF THE HEMIAPHRAGM FOR EARLY PULMONARY TUBERCULOSIS: John Alexander (American Review of Tuberculosis, 1924, x, 27).

This contribution from the Department of Surgery of the University of Michigan Medical School has reference to the removal of the upper portion of the phrenic nerve in order to paralyze one-half of the diaphragm. It has, according to the author, been found useful in the treatment of:

A. Acute, highly febrile, progressive caseous type of pulmonary tuberculosis in which pneumothorax and extra-pulmonary thoracoplasty are contraindicated.

B. For the less acute types in which pneumothorax cannot be induced because of adhesions or in which thoracoplasty is feared because the patient's general condition is poor.

C. For those cases in which no contraindications to pneumothorax or thoracoplasty exist but in which phrenicotomy might be expected to effect as good results or to supplement a pneumothorax or thoracoplasty.

The radical phrenicotomy proposed, the technique of which has been described by the author in previous articles, is considered preferable to simple section of the nerve in the neck, as the diaphragm sometimes fails to remain paralyzed after the latter procedure. The effect of the more radical procedure is a marked diminution of the capacity of the side of the chest affected on account of the rise of the

diaphragm, which sometimes amounts to 11 cm. distance above its level on the other side.

Felix, Sultan and Zadik are quoted as having secured satisfactory clinical results but no details are given.

A. T. LAIRD.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

INFLAMMATORY CARCINOMA OF THE BREAST:

Lee and Tannenbaum (Surgery, Gynecology and Obstetrics, Nov., 1924). The authors present a study and analysis of twenty-eight cases of inflammatory carcinoma of the female breast.

The condition is rare, representing but 1.3% of all cases of mammary cancer, and presents such unusual clinical manifestations that they are often misinterpreted by the physician first consulted. Examples of this unusual type of mammary cancer have been described by numerous observers but with variations in terminology, suggesting the uncertainty which exists regarding its true nature.

The disease is often fulminating and may result fatally in a short time without subjective symptoms, other than heaviness and slight burning sensation. The breast on the affected side usually increases in size, the enlargement being more often diffuse, but in some instances a rather ill-defined tumor may be mapped out which is often soft in consistency and never of stony hardness. Almost always the lesion has occurred in patients with pendulous breasts, and in 50% of these cases lactation had never occurred.

The rate of growth is very rapid and often the tumor fills the entire breast in a few weeks. Shortly after the onset of symptoms a careful physical examination will reveal certain inflammatory manifestations in and about the involved breast. The overlying skin is reddened and brawny and this blush may extend far beyond the normal limits of the mammary gland. Upon palpation the skin is hot and often slightly tender. Both breasts may be involved almost simultaneously or in rapid succession. When seen early nipple retraction may be absent, but later there is definite retraction and sometimes edema. The axillary nodes of the same side become involved early, increase rapidly in size, and are unusually bulky. The supraclavicular nodes of the same side are palpable early. Later nodes in the opposite axilla become involved and the opposite breast may be invaded by the disease.

As the disease progresses the skin becomes deep red or reddish purple and to touch is brawny and infiltrated. The inflamed area presents a distinct raised periphery and is easily recognized. The redness may extend far beyond the normal confines of the breast. As a rule there is no well marked elevation in temperature and there are no constant

blood findings. The patients remain well nourished until late in the course, cachexia appearing only in the terminal stages. They die from systemic metastasis with certain evidence of toxemia. The inflammatory symptoms of the disease persist until the end.

The whole picture is one of an acute fulminating process and appears to be a distinct clinical phase of carcinoma of the breast. Many of the patients in this series were young women, the average age for the entire group being 44.6 years. The most striking pathological change is a wide invasion of the dermal lymphatics by carcinoma. Bacteriological and biochemical studies have failed to explain the inflammatory manifestations.

Surgery is contraindicated in this disease, probably because of the diffuse invasion of the dermal lymphatics. At present radiation offers the only hope of palliation, diminishing the patient's suffering and giving a definite prolongation of life.

J. W. STINSON, M.D.

ENTEROSTOMY AS A THERAPEUTIC AND DIAGNOSTIC MEASURE: Miles D. Porter, M.D. (Annals of Surgery, vol. lxxx, Oct., 1924, page 501). The author states that enterostomy might be resorted to more often than it is and with advantage. Enterostomy is used to signify opening of any part of the intestinal tract regardless of whether or when closure is to follow.

Many patients with acute bowel obstruction complicating abdominal infection die from obstruction which is not relieved. The author reports one case in which a patient with puerperal infection and extreme abdominal distention recovered rapidly and satisfactorily following an enterostomy done in bed.

"Enterostomy in an obstructed loop of intestine prior to removal of the cause of obstruction will frequently aid in determining whether or not excision is necessary, will lessen the danger of fatal toxemia following the relief of the obstruction, and make the relief of the obstruction much easier.

"Given a volvulus or strangulated hernia wherein the viability of the involved bowel is questionable, opening and draining the gut helps one to determine more quickly and certainly for or against excision and removes the danger of toxemia from the passage of the stagnant content through the remaining part of the gut."

Many deaths following operation for bowel obstruction might be prevented by opening and draining the obstructed bowel of its contents *before the obstruction is removed*.

Several cases of supposedly malignant conditions of the colon are cited which were relieved and cured by colostomy, and a case of supposedly malignant obstruction of the pylorus was reported relieved and cured by gastrojejunostomy.

Colostomy relieves some cases of diverticulitis of the sigmoid and rectum.

Horsley advises enterostomy after resection of the colon. Enterostomy is also advised by others, particularly when the resection is on the right half of the colon in which a preliminary colostomy has not been done.

WM. P. HERBST, M.D.

EXTRAPLEURAL THORACOPLASTY IN THE TREATMENT OF PULMONARY TUBERCULOSIS: Wm. H. Thearle (*American Review of Tuberculosis*, 1924, x, 1). The use of the Brauer-Friedrich operation in which the major portions of all ribs on one side of the chest were resected has practically been abandoned for collapse therapy. The operation at present understood under the term "extra-pleural thoracoplasty" is the surgical collapse developed and standardized by Sauerbruch. It consists briefly in the subperiosteal resection of various lengths of the first or second to the tenth or eleventh ribs posteriorly. The operation is begun over the lower lobe and is performed in one or two stages.

The author's rule for thoracoplasty indication is as follows: "Thoracoplasty is indicated for those patients who should have an artificial pneumothorax but in whom a pneumothorax is impossible on account of pleural adhesions." This means essentially unilateral pulmonary involvement, or if a lesion is present in the other lung, as is usually the case in chronic phthisis, that this lesion be slight or arrested and that artificial pneumothorax has been tried and found impracticable.

The report presented is based on the experience of the author in 13 patients treated during the past year. The patients were mostly adult males at the Fitzsimon's General Hospital of the U. S. Army at Denver. Two patients died from the operation, two are unimproved on account amyloid visceral changes and intestinal tuberculosis which appeared soon after the operation, six are markedly improved, one case is slightly improved and two cases are practical cures, according to Sauerbruch's definition. The time the cases have been under observation is hardly long enough to warrant conclusions as to permanent cure.

The author believes that thoracoplasty should be performed in indicated cases at an earlier period in the disease.

A. T. LAIRD.

UNRECOGNIZED HEMORRHAGE WITHIN THE UPPER LEG: Larkin (*Surgery, Gynecology and Obstetrics*, Nov., 1924). The author calls attention to the possibility of losing enough blood in the upper leg following injury to cause death, and he cites four cases of injury to the upper leg which ended fatally. Death may come either instantaneously from rapid extravasation of blood, or from slow oozing for hours or even days. The cases presented showed symptoms of shock and hemorrhage following the injury with no external signs of bleeding to account for it.

At autopsy the circumference of the injured legs was found to be greater, and, when opened, one and one-half to two quarts of blood were present infiltrated between the fascial planes and musculature. The condition of hemorrhage can be overlooked easily unless the injured leg is compared with the uninjured.

In cases of death following fracture of the femur an unrecognized extensive hemorrhage within the leg may actually be a factor of paramount importance in the fatal issue. In crushing injuries to the thigh with or without fracture, with progressive symptoms of shock, a progressive increase in the circumference of the thigh may direct attention to a serious hemorrhage in soft tissues of the part.

J. W. STINSON, M.D.

FRACTURES ABOUT THE UPPER END OF THE HUMERUS: Howard E. Santee (*Ann. of Surg.*, July, 1924). This paper analyzes seventy-five consecutive cases of fractures of the upper end of the humerus, namely: head, neck and adjacent portion of shaft.

The fractures are grouped on anatomical lines as well as on the basis of pathological displacement, as follows:

- (1) Anatomical neck—4 cases
 - (a) Simple—3 cases
 - (b) With dislocation—1 case
- (2) Greater tuberosity—5 cases
 - (a) Simple—4 cases
 - (b) With dislocation—1 case
- (3) Lesser tuberosity—2 cases
 - (a) Simple—0 cases
 - (b) With dislocation—posteriorly 2 cases
- (4) Surgical neck—64 cases
 - (a) Simple with slight or no displacement—13 cases
 - (b) Simple with gross displacement—31 cases
 - (c) Complicated combining gross displacement of neck with greater tuberosity displacement—17 cases
 - (d) With dislocation—3 cases

Treatment and results:

Group I—Two cases were treated by excision and two by suspension, abduction and rotation. Results were all ultimately good.

Group II—Here the treatment is suspension, abduction and external rotation, with good results in from five weeks to eleven months.

Group III—The treatment of these cases will be discussed in a later paper.

Group IV—(a) Treatment. In fifty cases suspension, traction, abduction, and external rotation were used. The optimum position is wide abduction with external rotation. Angulation at site of fracture occurs in some cases when the upper end of the shaft is grossly displaced internally. Muscle spasm in the pectoralis major, latissimus and teres major probably play the major role in the angulation. In these cases it is necessary to gradually abduct the arm reaching the maximum in from seven to ten days. The fractures are suspended for four weeks, then immediate active exercise is encouraged. This treatment is thought the most logical because the disability manifests itself in three divisions; limitation in abduction and rotation, and loss of power.

(b) Results:

I—Fractures of surgical neck with little or no displacement. Six cases were followed; one treated by a Sayre dressing, good result in three months; one treated by abduction and external rotation on pillows, good result in four weeks; three cases suspended, good results in eight.

nine and twelve weeks; one fair function in one year treated by suspension.

II—Fractures of surgical neck with gross displacement. Nineteen cases followed, all treated by suspension; fifteen good functioning shoulders in from two to nine months; thirteen within five months; two fair results when last seen at two and three months, respectively; two distinct failures.

There were six cases of fractures of the surgical neck which required operations. The indications for operation were: (1) complicating dislocation not reducible; (2) gross displacements or comminution of the head where no apparent contact between fracture surfaces could be established. Of the six cases operated upon, five were complete failures and only one showed a little encouragement.

E. A. BOTHE.

MALIGNANT EPITHELIAL TUMORS OF THE THYROID: Allen Graham, M.D. (Surgery, Gynecology and Obstetrics, Vol. XXXIX, December, 1924, No. 6, pp. 781-790). One hundred and thirty-four patients with thyroid disease form the material upon which this study was made, which includes all cases at the Lakeside Hospital from 1905 to 1922. One hundred and twenty-two tumors were studied pathologically, consisting of one parastruma, ten sarcomata, three sarcoma-carcinomata, and 108 epithelial tumors, malignant or suspicious. The last group only is considered at this time. The incidence of malignancy in thyroid tumors varies between one and two per cent.

"Carcinoma is intended to include all epithelial tumors that show any clinical or pathological evidence of malignancy. Malignant adenoma is applied to any tumor that is or was an adenoma and has become malignant. Malignancy is evidenced by one or more of the following: Local invasion, recurrence of the original tumor after incomplete excision, metastasis, death of the patient due to the invasion of the tumor."

The histological picture of invasion of the capsule, invasion of the blood vessels, recurrence, or metastasis is invariably evidence of malignancy. In only thirty to forty per cent of the cases reported here was such histological evidence found, leaving from sixty to seventy per cent in which malignancy was doubtful morphologically.

The malignancy of the tumor does not depend upon the morphology, differentiation, et cetera, of the individual cells or groups of cells, but upon local invasion or destruction, postoperative recurrence, distant metastasis, and the death of the patient.

"The most constant single indication of thyroid epithelial malignancy is invasion of the blood vessels. Scirrhus and papilliferous adenocarcinomata are the only two types of epithelial malignancy in which invasion of the blood vessels has not been observed. These two types constitute about fifteen per cent of the total, and are primary lymphatic invaders."

There are many photomicrographs in this article to illustrate the text.

WILLIAM P. HERBST.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

FOREIGN BODIES IN THE AIR AND FOOD PASSAGES OF INFANTS AND CHILDREN, WITH ESPECIAL REFERENCE TO THE CLINICAL DIAGNOSIS:

Russell S. Rowland, M.D. (Am. Jour. Diseases of Children, August, 1924). The diagnosis of foreign bodies in the air and food passages rests on the history, the physical signs and symptoms, and the roentgen-ray and endoscopic examinations. The object of this paper is to stress the importance of the history, symptoms and physical signs; in other words, the clinical diagnosis as well as the study by roentgen ray and endoscopy in every suspected foreign-body case. Jackson says that the roentgen ray is the most valuable single aid in diagnosis, but that a careful physical examination should always be made first. In many instances it is only by seeking the history and studying the signs and symptoms that an early diagnosis, frequently so essential to successful surgical treatment, can be made. McCrae finds that from 10 to 15 per cent of all such foreign bodies cannot be demonstrated by roentgen ray. In such patients the physical examination is of the utmost importance, and the diagnosis should be completed by an endoscopic examination.

Foreign Bodies in the Bronchi and Lungs: McCrae, in discussing this subject, mentions three important diagnostic points: (1) decreased expansion of the affected side, (2) "tissue paper râles." These râles he described as finer and softer than the early crackling râles heard in lobar pneumonia. They occur at the end of inspiration, are more marked on deep breathing and give the impression of coming from a distance, (3) "asthmatoïd wheeze." It differs from the wheezing sound heard with bronchial asthma but the difference is difficult to describe. The wheeze varies in pitch and loudness depending on the character of the foreign body causing it. It can never be heard over the chest wall.

Usually the higher the foreign body is lodged in the respiratory tract, the more pronounced the symptoms; while the lower down it is, the more marked the physical signs. With bronchial foreign bodies signs of partial or complete obstruction of a bronchus are diagnostically of the most importance. A fuller appreciation of these facts and of the importance of the history, signs and symptoms will help us to recognize more promptly some of the unusual foreign-body cases; it will assist us to differentiate the acute conditions from pneumonia, and the chronic cases from tuberculosis and empyema.

R. N. ANDREWS, M.D.

TREATMENT OF PROLAPSE OF RECTUM BY ALCOHOL INJECTION: Alan Brown, M.D., and T. G. H. Drake, M.D. (*Archives of Pediatrics*, October, 1924). Many methods have been advocated for the treatment of rectal prolapse, most of which are not very satisfactory.

The authors wish to report three cases, one with autopsy findings, in which cures were obtained by the simple method of alcohol injection. In a paper by Findlay, records of 23 cases cured by this method are reported.

The procedure is as follows: The skin about the anus is cleansed by alcohol. The patient is then given a general anesthetic. A needle 3 inches long is attached to a Luer syringe containing 1½ c.c. of absolute alcohol. This is inserted at one side of the anus, ¼ inch outside the junction of the mucous membrane and skin, and just posterior to the middle line with the child on its back. With the finger in the rectum as a guide, the point of the needle is passed up along the rectum and at a distance of 2 to 2½ inches the whole of the alcohol is injected, the needle withdrawn and the procedure repeated on the opposite side. The buttocks are then strapped together with adhesive. The most satisfactory strapping in their experience was a fairly wide single piece of adhesive, with the edges picked to conform to the shape of the body more readily, having a small opening cut in the center through which to pass stools. A diaper with a pad is fixed firmly over this and the strapping is kept in place for from one to two weeks, after which no further treatment is necessary.

The treatment can be readily performed and there is no difficulty experienced in injecting the alcohol in the proper place. Care should be taken not to tilt the tip of needle too far forward towards the anterior abdominal wall to prevent entering the peritoneal cavity. The theory of the action of the alcohol is that it sets up adhesions between the bowel and the tissues about it, and through these adhesions, and since through the prevention of any further prolapse the tone of the sphincter is restored, a cure is obtained. In only five of Findlay's cases was more than one treatment necessary.

R. N. ANDREWS, M.D.

A STUDY IN PREVENTIVE AND SOCIOLOGICAL MEDICINE: Mark S. Reuben (*Arch. of Ped.*, July, 1924). The home is the fundamental basis for consideration and improvement, if there is to be any improvement in any individual member. Economic conditions of the family must therefore receive careful attention. When there is proper adjustment of internal to external relations we have perfect health. If the income of the father is not enough to cover the necessities of life and does not permit a minimum normal standard of living, then either mother and children are driven into industry and home life is neglected or else the standard is lowered, and we have bad housing, undernourishment and all other hideous results of poverty. The home should be the foundation of social improvement. Two-thirds of the delinquent children come from homes that no city should permit to exist.

R. N. ANDREWS.

MORBID HABITS IN INFANCY AND CHILDHOOD: Joseph H. Marcus (*Arch. of Ped.*, May, 1924). The child is a creature of habits, good and bad, and there is no period of life at which habits are so readily established as in infancy and childhood. Among these bad habits are mentioned the following: masturbation; sucking; pica, or perverted appetite; nail-biting; teeth-grinding; head-rolling and head-banging; habit spasm.

The vast majority of cases of masturbation in infancy and childhood occur in girls; the true masturbation of late childhood is much more common in boys. One reason which may account for its frequency in girls is the great liability to vulval irritation from lack of cleanliness or from actual vulvovaginitis. Any irritation may cause the child to rub the parts in some manner, and a pleasurable sensation being excited, this action is repeated until the habit has been established. Only in a few cases does the child use the hands to cause friction to the genitals.

One important factor in the successful treatment of this condition is its early recognition. The child should be kept in a sitting posture as much as possible, as the habit is oftentimes practiced when in the reclining posture. If there is definite evidence of inflammation or local irritation, a calamine lotion will be found useful. Belladonna combined with the bromides sometimes brings about a beneficial result; the belladonna is gradually increased and the reaction cautiously watched. Whatever form or forms of treatment are used, it must be impressed upon the parents that this habit is a decidedly pernicious one, and that it must be eliminated at all costs. The mother or father should talk to the child in a matter of fact manner, and should make every effort to gain the confidence of the child, and direct her influence towards the strengthening of the child's will and character.

Thumb-sucking and tongue-sucking: Deformities of the thumb or the finger are sometimes produced; also of the teeth and lips, and even of the jaws. Mechanical restraint in infants is the only successful cure in most cases. Splints or cuffs applied to the elbow, so as to prevent flexion, are a most useful procedure.

Pica or perverted appetite is a peculiar and very curious desire to eat queer articles of diet, such as mud, mortar, coal, cinders, gravel, plaster from walls, paper, and hair. The treatment must be of vigilance on the part of the guardian or the nurse, in the prevention of this abnormal appetite for foreign articles.

Nail-biting: This habit is best remedied by keeping the fingernails cut very short, and by the wearing of gloves or mittens.

Teeth-grinding: The habit may be caused by caries of the teeth. In most cases there is a chronic indigestion present.

Habit spasm: Children sometimes develop certain spasmodic contractions of a group of muscles that may result in a rather distressing habit. This condition of habit spasm is simply a sign of a neurotic tendency, and, generally speaking, leads to no bad results. In many cases having the child sit before the mirror while making the effort to control the spasm may prove effective.

R. N. ANDREWS.

CLINICAL STUDY OF LACTIC ACID MILK AS A ROUTINE FEEDING FOR SICK AND HEALTHY INFANTS: Manning C. Field (Arch. of Ped., August, 1924). Now the most important reasons why lactic acid milk is better suited to the needs of infants than is sweet milk, assuming artificial feeding to be necessary, are as follows:

1. The protein in acid milk is precipitated as a fine flocculent curd and remains so in the stomach until the process of digestion has broken it down. The boiling of raw milk partially accomplishes the same thing, but also partially destroys the vitamins.

2. An extremely important factor in selecting a food for young infants is its "buffer" or, as Marriott says, its acid-binding qualities. Lactic acid milk is similar in this respect to breast milk, the pH of the gastric contents at the height of digestion of a group of infants fed on whole lactic acid milk having been found to be 3.71, while the average hydrogen ion concentration of the stomach contents of the same group fed on breast milk was 3.75, which is probably about the optimum concentration for gastric digestion in infants under one year.

3. A third reason why lactic acid milk is better than sweet milk for feeding infants is that it is practically sterile even under the most adverse conditions, or rather under the most favorable conditions for bacterial growth, other than the presence of lactic acid.

4. Furthermore, in lactic acid milk we have a maximum of food value with a minimum of bulk, which in many cases is of distinct advantage. In lactic acid milk we have this increased protein as well as fat approximating in percentage, and apparently in digestibility, that of breast milk.

Up to the present the author has seen no ill effects from feeding lactic acid milk routinely to sick and well babies; on the contrary, he has found it, clinically, to have definite advantages over the usual sweet milk mixture. He has modified it somewhat at times by varying the amounts of karo and by removing part or all of the cream, and in one or two instances by adding a small amount of water.

R. N. ANDREWS.

THE RELATION OF GONORRHEAL PROCTITIS IN MALE INFANTS TO HOSPITAL EPIDEMICS OF VULVOVAGINITIS: Albert H. Byfield, M.D., and Mark L. Floyd, M.D. (Archives of Pediatrics, October, 1924). Rectal gonorrhea in male infants may occur in the course of a ward epidemic and not cause sufficient signs and symptoms to arouse suspicion that this trouble is present.

Such infection may be the source of repeated late outbreaks when the epidemic is believed to have been stamped out.

The rectal thermometer is probably the carrier.

It is always well to check up in hospitals on the custom of taking temperature. Trays with individual receptacles for thermometers or individual containers for thermometers should always be used in a baby's ward.

R. N. ANDREWS, M.D.

ROENTGENOLOGY

SUPERVISORS:

LEO G. RIGLER,

MPLS. GEN'L HOSPITAL, MINNEAPOLIS

A. U. DESJARDINS,

MAYO CLINIC, ROCHESTER

COOLIDGE TUBE QUANTITATIVE VARIATIONS: MacKee and Andrews (Am. Jour. Roent., June, 1924). Coolidge and Kearsley demonstrated, by means of ionto quantimeter measurements, that considerable variation occurred in the energy output of different Coolidge tubes. Apparently the difference was much less marked in filtered than in unfiltered radiation. As a result, radiotherapists are advocating the use of filtered radiation in skin therapy for purposes of greater safety.

The authors conducted a series of practical experiments using ten different Coolidge tubes, unfiltered, delivering either an erythema or an epilation dose under exactly similar conditions. They found that, in spite of marked differences in the energy output, as measured by the ionization chamber, the differences in reaction produced by the different tubes were so slight as to be negligible.

In view of these experiments and the practical experience of radiotherapists, they believe that the factor of safety is so large that unfiltered radiation, measured by indirect methods as now generally used, can continue to be used without danger of untoward results due to differences in energy output of different Coolidge tubes.

LEO G. RIGLER.

INVERSE SQUARE OF DISTANCE LAW FOR FILTERED ROENTGEN RADIATION: MacKee and Andrews (Am. Jour. Roent., July, 1924). Chiefly as a result of pastille measurements, Witherbee and Remer have attempted to prove that the intensity of radiation varies inversely as the distance in filtered radiation, in contrast to the rule in unfiltered radiation, in which it varies inversely as the square of the distance.

The authors believe pastille measurements to be entirely unreliable. They conducted two series of experiments. In one they measured energy output by the ionization chamber; in the other they determined the effects upon the skin of filtered radiation at various distances and various periods of exposure.

Their experiments indicate that the "inverse square of distance" law holds for filtered radiation as well as for unfiltered. There is such a large margin of safety in filtered radiation that it is difficult to detect differences in reaction with exposures which differ radically. Nevertheless, the ionic measurements and careful observation of the intensity and duration of the reactions indicate clearly that double the distance requires quadruple the time to obtain equal reactions.

LEO G. RIGLER.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

REPORT OF THE SCIENTIFIC RESEARCHES ON THE VENEREAL DISEASES. Edward L. Keyes, M.D. New York: The American Social Hygiene Association, 1924.

THE PRACTICAL MEDICINE SERIES. GENERAL SURGERY. Vol. II. Albert J. Ochsner, M.D., Editor. Chicago: The Year Book Publishers, 1924.

MEDI-CULT. THE A-B-C OF THE MEDICAL PROFESSION. B. F. Lorance, M.D. 73 pages. Boston: Richard G. Badger, The Gorham Press, 1924.

OUTLINES OF PATHOLOGY. E. T. Bell, Prof. of Pathology, University of Minnesota; William A. Riley, Prof. of Entomology and Economic Zoology; B. J. Clawson, Asst. Prof. of Pathology; J. C. McKinley, Asst. Prof. of Neuropathology; William A. O'Brien, Instructor in Pathology; John F. Noble, Instructor in Pathology. Edited by E. T. Bell. 586 pages. Minneapolis: University of Minnesota Press, 1924.

LOCAL ANESTHESIA SIMPLIFIED. John Jacob Posner, D.D.S., New York, Chief of Dental Department, Harlem Dispensary, etc. 114 pages. 55 illus. Cloth, \$3.50. St. Louis: C. V. Mosby Co., 1924.

TREATMENT OF THE COMMON DISORDERS OF DIGESTION. John L. Kantor, Ph.D., M.D., New York

City. 245 pages. Illus. Cloth, \$4.75. St. Louis: C. V. Mosby Co., 1924.

This small volume is meant for a guide in the treatment of the more common forms of digestive disturbances. The technique of stomach lavage and the use of the duodenal tube are thoroughly discussed. One of the best things in it is the diet lists which are reprinted from the Vanderbilt Tables.

This volume would be an addition to anyone's library, from the viewpoint of the diet list alone.

W. C. CARROLL, M.D.

DIABETES: A HANDBOOK FOR PHYSICIANS AND THEIR PATIENTS. Philip Horowitz, M.D. 2nd edition. 231 pages. 34 text illus. Cloth, \$2.00. New York: Paul B. Hoeber, Inc., May, 1924.

Although this book is described as a handbook it does not seem to fulfil its purpose. It is entirely too technical for the patient and does not give the detailed information that the physician desires. Too many case histories are given without enough laboratory information. The number of cases could well be reduced and a few described with more detail.

The methods of arriving at a glucose tolerance are well described. A little more discussion on the threshold of ketogenesis would be welcome. This volume could be expanded into a larger and more pretentious work. There is no question but that the author has had a great deal of experience and thoroughly understands the subject on which he writes.

MAX H. HOFFMAN, M.D.

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MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association
Northern Minnesota Medical Association and Minneapolis Surgical Society*

VOL. VIII

MARCH, 1925

No. 3

ORIGINAL ARTICLES

HEPATIC FUNCTIONAL TESTS IN EXPERIMENTAL JAUNDICE*

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During the past year a group of men in the Mayo Clinic has been interested in developing and testing a number of methods for the clinical determination of hepatic insufficiency. Since the liver is an organ of manifold functions, a great many tests have been devised which deal with these individual functions. Many of these methods are of doubtful value; others have interesting possibilities and appear promising from the clinical standpoint. It seems very unlikely that any single test will ever be able to measure the sum of all the activities of the liver. Dr. Greene and I have recently studied a number of the more promising tests for hepatic function in cases of experimental obstructive jaundice with a view to determine the value of the various tests under controlled conditions, and to provide an experimental background for the interpretation of the functional deviations observed in patients with obstructive jaundice. Among the tests used by us were those for carbohydrate tolerance, the nitrogen partition of the blood, the Widal hemoclastic crisis, coagulation factors, blood fibrin and calcium, the hemoconia test of Brulé, the quantitative determination of serum bilirubin by van den Bergh's method, and the phenoltetrachlorophthalein test of Rowntree and Rosenthal.

The relation of the liver to carbohydrate metabolism has been appreciated since the time of Claude Bernard. Recently Mann has demonstrated in hepatectomized animals that the liver is essential for the maintenance of a normal blood sugar level. On theoretic grounds it would seem that the ideal

clinical test for hepatic function would be one which determined the ability of the liver to assimilate carbohydrate. Since the classical experiments of Sachs on liverless frogs, fructose has been the most approved sugar for this purpose. It is believed that this sugar is rapidly absorbed from the alimentary canal, and after its conversion to glucose, is stored by the liver. During the whole process no significant rise in blood sugar occurs. Theoretically, therefore, if the hepatic parenchyma is damaged, the ingestion of fructose should cause a sharp rise in blood sugar.

In animals with experimental obstructive jaundice, positive fructose tolerance tests occur about the sixth day after the occlusion of the common duct; thereafter, these tests remain positive until the death of the animal. Occasional negative tests are found, but in general the ability of the organism to assimilate fructose is greatly reduced in this condition.

Fructose tolerance is also diminished in other types of toxic injury to the liver. Bodansky in particular has used the newer methods of studying sugar tolerance, and has demonstrated definite changes in chloroform, phosphorus, and hydrazine poisoning.

The clinical application of such experimental findings is difficult. There are numerous factors, such as pituitary, pancreatic and other endocrine disorders, which must be considered in any case in which the ability of the organism to metabolize carbohydrate is reduced. Judd has particularly emphasized the frequent association of surgical evidences of pancreatitis with disease of the biliary tract.

In our study of the test in patients with obstructive jaundice, we have not been able to show specific changes which could be definitely ascribed to hepatic damage, per se. Our clinical experience with other diseases of the liver has been similar. In general, we feel that while fructose tolerance tests are valuable from an experimental standpoint

*Read before the Minnesota State Medical Association, St. Cloud, October, 1924.

they are of questionable importance in the diagnosis and treatment of the individual patient.

The liver is likewise known to be the seat of much of the intermediary nitrogen metabolism of the body. Frerichs was one of the first to recognize the importance of the finding of crystals of the amino-acids, leucin, and tyrosin, in the urine of patients with acute yellow atrophy. During the past two decades much has been written concerning urinary nitrogen partition in hepatic disease. Rowntree, Marshall and Chesney have emphasized the difficulty of interpretation in such studies, and have called attention to the accompanying changes in the blood; they found that the normal proportion of blood urea was decreased in hepatic disease. More recently, Bollman, Mann and Magath have reported evidence of diminished urea formation in dogs following the complete extirpation of the liver. In our experimental animals there was usually a sharp and definite decrease in both the proportionate and absolute values for blood urea following the induction of obstructive jaundice. These low values persist until shortly before the death of the animal, when a terminal rise of blood urea occurs. This is probably an evidence of terminal renal insufficiency; in this respect the condition in experimental animals is comparable to that described by Walters and Parham in patients dying of obstructive jaundice. Other nitrogenous constituents of the blood showed no change worthy of particular mention.

Blood urea estimations in a series of forty patients with obstructive jaundice gave results somewhat below the average normal limits. The decrease, while indicating the possible similarity of the change to that seen in experimental animals, was not sufficiently marked to be of diagnostic value in the individual case.

The hemoclastic crisis of Widal has recently been put forward as a clinical test for the proteoepexic activity of the liver. This test is based on the theory that a normal hepatic parenchyma is essential to the production of the so-called digestive leukocytosis. In the presence of hepatic disease, a leukopenia should follow the ingestion of a protein meal, and to this phenomenon the term hemoclastic crisis has been applied. We have employed the test both clinically and experimentally, and have not been able to establish its diagnostic value.

An increase in the ultramicroscopic blood fat particles, or hemoconia, after a fat meal, has been

used by Brulé as an index to the presence of bile salts in the intestine. With biliary obstruction this normal increase does not occur. It is obvious that this test gives results roughly comparable to an examination of the stools for bile. French clinicians particularly have emphasized the importance of this test in determining the presence or absence of common duct obstruction, and our clinical and experimental studies have in general given confirmatory evidence on this point.

The formation and excretion of bile are characteristic activities of the liver. Since the most striking hepatic disorders are those accompanied by retention of bile and consequent jaundice, much attention has been paid to the presence of bile pigments in the blood, urine and feces. As has been repeatedly shown, bile retention damages the hepatic parenchyma, the amount of destruction being very roughly proportionate to the degree and duration of this retention.

It is quite natural, therefore, that the pioneers in the field of hepatic physiology should have attempted to demonstrate the bile pigments in the circulating blood, and in the urine. A century ago Tiedeman and Gmelin reported the presence of a color reaction produced by the addition of nitric acid to the blood serum of a patient with jaundice (Gmelin's test).

Recently various attempts have been made to measure the bilirubin content of the serum. The simplest methods have been based on the theory that the intensity of the serum color is an index to the quantity of bilirubin, since the latter is the chief pigment of blood serum. A colorimetric comparison, using a 1:10,000 solution of potassium bichromate as a standard, has been widely used, the readings being termed the "icterus index." This method is quite satisfactory for following variations in the degree of frank icterus, but difficult of application in conditions in which the serum bilirubin is only slightly increased. Confusion may also arise through the presence of xanthophyll and carotinoid pigments in the blood. These substances may be present in sufficient amounts in carotinemia to cause frank skin discoloration. By modifying the original Gmelin's test, a number of attempts have been made to produce green or blue oxidation products of bilirubin under conditions permitting quantitative estimation of the amount of color developed. These methods have in general been disappointing, and it remained for van

den Bergh to develop the wholly satisfactory test which bears his name.

The simplicity of this procedure commends it for general clinical use. Ehrlich's diazo-reagent is added to blood serum or plasma; the immediate development of a violet tint is termed a "direct" reaction. The proteins are then precipitated by the addition of alcohol, and a definite rose-pink color develops in the supernatant fluid. This phase of the test is termed the indirect reaction. Van den Bergh has claimed that a direct reaction is diagnostic of obstructive jaundice. However, there are serious theoretical and practical objections to this point, and in my opinion no such sharp differentiation is possible. The quantitative measurement of serum bilirubin can be made by comparison with an inorganic standard, the color of which corresponds to a 1:200,000 solution of azobilirubin.

Bilirubin is not a normal constituent of dog serum. It appeared in the blood of these animals in increasing amounts after ligation of the common duct; large quantities were not found until forty-eight hours or more after operation. These values increased gradually after the first two weeks, and then remained constant until death. In animals with cholecystectomy and ligation of the common duct, bilirubin appeared in the serum in large amounts within twelve to twenty-four hours after operation. Usually a secondary fall occurred, with a subsequent rise, the level thereafter remaining constant. Clinical icterus usually appeared at the same time as the first direct van den Bergh reaction and deepened somewhat during the latter part of the postoperative course. Mann and Bollman have previously demonstrated the delayed appearance of jaundice in consequence of the presence of the gallbladder, ascribing the phenomenon to the concentrating activity of this organ.

The quantitative determination of serum bilirubin is of great clinical value. Normally human blood contains from 0.5 to 2 mg. for each 100 c.c.; in cases of obstructive jaundice of long duration, concentrations of serum bilirubin only slightly less than those found in fistula bile have been observed. The level of this pigment in the serum does not parallel the amount excreted in the urine, and neither can this level be estimated with certainty from the degree of skin or scleral discoloration.

From an experimental standpoint the test is of greatest importance in estimating the amount of

bile retention in cases of obstructive jaundice, and in following the course of jaundice due to any cause.

The phenoltetrachlorophthalein test for hepatic function is based on the fact that a normal liver rapidly removes this dye from the blood stream after its intravenous injection. If the liver is diseased this removal is accomplished much more slowly, and by estimating the amount of dye in the blood serum at measured intervals after its injection, the degree of dye retention may be established.

Following the ligation of the common bile duct in dogs, no retention of phenoltetrachlorophthalein was observed until the second or third day following operation. The development of distinct dye retention usually coincided with the first marked appearance of bile in the blood. Thereafter the amount of dye retention gradually increased, running parallel with the degree of bile retention until the death of the animal.

In animals with cholecystectomy in addition to common duct ligation, dye retention was found within twenty-four hours after operation. Here, too, a close parallelism with the amount of serum bilirubin was observed, both the bile pigment and the dye showing high grades of retention on the first day after operation. Animals in this group were much more affected by their biliary obstruction than those with simple ligation of the common duct, and jaundice appeared clinically at an earlier date. A secondary fall and subsequent rise in both bilirubin and dye retention was the rule in these animals, the curves, however, tending to become constant after the third week.

DISCUSSION

The pathologic changes in the liver following biliary obstruction are well known. The functional disturbances indicated by the changes in certain of the tests studied are scarcely less striking. Several of the tests failed to show definite changes, implying either that these tests are not specific, or that the changes incidental to the obstruction were not sufficiently great to permit of their demonstration by these methods. The liver is an organ with a large factor of safety. A considerable proportion may be removed without disturbing normal physiologic activity. It is not surprising, therefore, that marked changes in the major functions relating to carbohydrate and protein metabolism are difficult to demonstrate.

Unfortunately no adequate clinical method for the study of bile acid metabolism is as yet available. Such a method would be of great value, for further data on this point are most desirable. The bile acids apparently are formed solely by the hepatic parenchyma, whereas the bile pigments, in part at least, are probably formed elsewhere and brought to the liver for excretion.

The studies in the serum bilirubin show the usefulness and value of this test in following the progress of jaundice. Equally significant is the close parallelism in these experiments between the amount of serum bilirubin and dye retention. Apparently the dye is always retained when there is bile retention from any cause. Whether this is due to functional or structural damage to the liver cells from a toxic action of bile, a mechanical impediment due to an overload on the hepatic filter, or to some other factors as yet unknown, cannot be definitely stated. Conclusions regarding the physiologic activity of the liver certainly should not be made solely on the basis of studies such as this. The changes shown by certain hepatic functional tests appear to be significant from the clinical standpoint, and further work along these lines may aid in the evolution of more sensitive and satisfactory tests of the integrity and functional efficiency of this organ.

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Note: For discussion of this paper and the one following, see page 144.

FUNCTIONAL TESTS IN HEPATIC DISEASE*

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In the past the most striking advances in the application of functional tests to clinical medicine have been made in the study of renal diseases. The kidney is preponderantly an excretory organ, and consequently peculiarly suitable for functional study. Both the initial material, the blood, and the excretory product, the urine, are readily available for analysis. The clinical study of the activities of the liver is much more difficult, for this is an organ of manifold functions, and our knowledge of the physiology is in many instances woefully inadequate.

The liver is concerned primarily with the blood borne to it by the portal vein; this blood comes from the abdominal viscera and contains many substances not present in the general circulation. The bile cannot be directly collected for study, and the material obtained by duodenal drainage is mixed with an unknown amount of intestinal content. The approach to the functional study of the liver, therefore, must be indirect and correspondingly difficult.

The physiologic experiments of Mann have emphasized the fact that bile pigment may be formed outside the liver, to be excreted by that organ. From both the physiologic standpoint and that of clinical usefulness, an analogy may be drawn between the study of serum bilirubin in hepatic disease and of blood urea in renal disease. We have pointed out the convenience of the test in following the changes in experimental obstructive jaundice in animals.³ It is of equal clinical usefulness (1) in estimating the amount of bile retention in patients with obstructive jaundice, (2) in giving a quantitative index to the degree of jaundice in the various toxic or infectious types, (3) in following the course of jaundice due to any cause, and (4) in demonstrating the presence of a latent icterus. In the latter connection a number of concrete diagnostic applications may be mentioned. In pneumonia, exophthalmic goiter, the toxemias of pregnancy, or following the administration of chloroform or arsphenamin, high bilirubin values predict the onset of toxic icterus with its grave prognostic im-

*Read before the Annual Meeting of the Minnesota State Medical Association, St. Cloud, October 8-10, 1924.

port. In cardiac disease, emphysema, or hypertension, rising levels of serum bilirubin presage passive congestion of the liver due to myocardial failure. In secondary anemias, excepting those of hemolytic origin, normal bilirubin values are the rule. For example, in differentiating between occult carcinoma and pernicious anemia, a high figure would argue for the latter diagnosis. However, in known carcinoma, elevation of the bilirubin value may often indicate metastatic involvement of the liver or biliary passages.

Serum bilirubin determinations are most valuable in the differential diagnosis of abdominal colics. As pointed out by Smithies,² less than a third of all biliary colics are followed by manifest icterus. Diagnosis may be extremely difficult in the remainder, which are not associated with jaundice.

Following such a colic the serum bilirubin is elevated, although not to a degree or for a length of time sufficient to color the skin or sclerae. The demonstration of latent icterus in such cases is diagnostic. We have also seen a few acute cases with severe but unlocalized abdominal pain, in which the finding of a serum bilirubin considerably above the normal has served to identify the source of the trouble.

The use of the dye, phenolsulphonephthalein, in the testing of renal function, is familiar to all. A further analogy between functional testing of the liver and kidney perhaps may be shown in the use of a closely related dye, phenoltetrachlorphthalein, in the study of liver disease. After intravenous injection, this dye is taken up from the blood stream by the liver and excreted in the bile.

Originally introduced into clinical medicine by Rowntree, Hurwitz, and Bloomfield, the attempt was first made to measure the excretion in the stools. Later the collecting of bile by a duodenal tube was substituted. Neither method was wholly satisfactory for routine clinical use. Rosenthal substituted the study of the rate at which the dye left the blood stream. In hepatic disorders the rate of dye removal is greatly reduced and changes are readily shown. It is the clinical use of this modified test, the Rowntree-Rosenthal test, that I will discuss.

The technic of the test is simple. The solution of the dye may be obtained in ampules. One cubic centimeter of this solution is injected intravenously for each 22 pounds of body weight. Fifteen minutes, one hour, and two hours later, blood samples

are taken, 5 c.c. at each time being ample. The clear serum is separated, a drop of alkali is added to bring out the color of the dye, and comparison made with standard tubes. Normally the dye is rapidly removed from the blood stream. At the end of fifteen minutes only 5 to 7 per cent remains, while at the end of an hour only traces of dye are present. In patients with obstructive jaundice, as much as 30 per cent of the dye may still be present in the blood stream, two hours after the injection.

We have demonstrated the experimental changes observed in dogs following ligation of the common bile duct. Bile retention promptly occurs in such animals, the time at which jaundice appears depending on the presence or absence of the gall-bladder. These dogs have a progressively increasing degree of dye retention, which closely parallels the increase in the serum bilirubin. The changes observed in patients are quite similar.⁴ A series of about forty cases of obstructive jaundice due to stone or postoperative stricture of the common duct have been studied at the Clinic. Cases of cholecystitis without jaundice showed only the slightest degree of dye retention. With the development of jaundice, the changes in the phenoltetrachlorphthalein test became definite and characteristic. In all cases there was a marked retention of dye in the blood stream. As in dogs with experimental obstruction of the common bile duct, the degree of retention of dye roughly corresponded to the degree of retention of bile pigment.

Following the operative relief of the obstruction in these patients, there was a rapid decrease in the serum bilirubin and the degree of dye retention. The serum bilirubin speedily returned to normal. Following the first decrease, however, the phenoltetrachlorphthalein test often showed a moderate but persistent degree of dye retention. This possibly is related to the residual hepatitis observed in nearly all individuals with obstruction over any extended period of time.

The changes observed in the other clinical varieties of icterus were quite similar to those seen in obstructive jaundice. In acute infectious or catarrhal icterus, in toxic jaundice whether associated with syphilis and treatment with arsphenamin, with pneumonia, or exophthalmic goiter, and in acute yellow atrophy of the liver, marked dye retention is present. Again the degree of dye retention closely parallels the increase in the serum bilirubin. In such cases icterus is the outstanding

fact, and it dominates both the clinical picture and the laboratory findings.

The dye test, however, is of greatest clinical value in the study of those cases of hepatic disease in which jaundice is not a factor. The obstetricians have already applied the test in the differentiation of the toxemia of pregnancy from neurotic vomiting and eclampsia of nephritic origin. In this condition the dye test apparently will show changes before the serum bilirubin increases markedly. In carcinoma of the gastro-intestinal tract, normal readings are obtained before extension of the growth begins. Moderate retention was found in a series of ten cases of carcinoma of the stomach or colon without jaundice. On opening the abdomen, the surgeon found obvious metastasis to the liver in eight of these patients, and in one of the others there was widespread glandular involvement. The degree of dye retention depends in part on the extent of the malignant process in the liver, so that a normal test will not positively exclude the presence of small metastatic nodules.

In cirrhosis the test shows definite changes, although the correlation of laboratory findings with the clinical picture must be made with care. In biliary, syphilitic, and atrophic cirrhosis, the finding of dye retention has definite diagnostic and prognostic value.

The various functional tests add but little from the standpoint of the differential diagnosis of hepatic diseases. This perhaps is to be expected, for experience with the use of renal function tests has likewise demonstrated that functional changes are not necessarily characteristic of the particular etiologic agent. The liver is an organ with a large factor of safety. Experimentally a large proportion of the liver can be removed, and the remnant still be adequate for normal function.

Again, disturbance in one type of physiologic activity does not indicate similar disturbance in others. The presence of a normal serum bilirubin and the absence of dye retention will not exclude hepatic disease. Positive tests, on the other hand, are of great value in indicating the probable presence of definite and widespread hepatic disease. Hence, although the present hepatic functional tests are not ideal, their introduction marks another milestone on the road to the better understanding of diseases of the liver.

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DISCUSSION ON THE TWO PRECEDING PAPERS

(DR. SNELL AND DR. GREENE)

DR. TUOHY (Chairman): In a discussion the other day, a well known surgeon from Chicago stated that the newer physics are always faster, and one of the bystanders stated that perhaps it was safer to stick to mineral water. Now, it is doubtful whether we have anybody competent to analyze the situation from the newer physics standpoint, but I notice Dr. Mayo in the audience, and I wonder if he will not give us some ideas.

DR. WILLIAM J. MAYO, Rochester: Mr. Chairman, I think we are all interested in the question of the function of the liver. When patients die following surgical operations we habitually try to classify the deaths in relation to the four vital organs. We know that people must die, the lungs give out most easily, and in the majority of cases we consider them the executioner. Next to the lungs as the cause of death we place the kidneys. In a small number of cases, the brain appears to be the final lethal agent, and in the least number of all, the heart is blamed.

Today we know just enough of hepatic function to look on the liver as a vital organ. We know that the process of life is one of oxidation, that the red-blood cell is the carrier of oxygen, and we can say, in a general way, that the red cell comes from the bone marrow. We know, too, that the white cell comes from the reticulo-endothelial system and that its chief function concerns repair and defense. We can say that the blood platelets are derived from the megakaryocyte cells in the bone marrow and are concerned, among other functions, with the clotting of the blood. All these formed elements of the blood can be studied with the microscope. We speak of the blood plasma as a liquid medium which carries these formed elements, yet how little we know about this fluid which lies in the ultramicroscopic field. The physicist has approached his problems through the ultramicroscope as an aid to the eye, because it is the eye which brings us the true information, and we are now in a field beyond its power to see, even with the microscope, which does not enable visualization beyond $\frac{1}{10}$ micron or $\frac{1}{250,000}$ inch. Those particles of matter which are from $\frac{1}{10}$ micron to $\frac{1}{1,000}$ micron,

1/25,000,000 inch, are called colloids. The colloid particles are too small to be seen directly, but they are large enough to scatter a ray of light, and they therefore refract the light ray, under the ultramicroscope. Beyond the field of the ultramicroscope lies the molecular and atomic field which has so far been analyzed experimentally by the electromagnetic vibrations of the x-ray, which is only 1/100,000,000 inch in length.

The blood plasma in a general way has its origin in the action of the liver on the contents of the portal vein. The products of the metabolic processes of the liver which concern the fundamental nutrition of the body and the elimination of waste products are all colloid and molecular substances, and are contained in the blood plasma.

Through the work of Greene, Snell and Walters, reported at this meeting, we have reliable tests of liver function. We begin to get an idea of the damage done by materials imperfectly metabolized in the liver circulating in the blood, to the so-called vital organs, the lungs, the kidneys, the brain, and the heart, causing them to act as executioners.

Consider jaundice, for instance. My colleague, Dr. Hallenbeck, first started profitable research work with the view of rehabilitating the blood of patients with jaundice to insure proper clotting following operation. Dr. Walters, acting on the suggestion of Lee and Vincent, began the intravenous injection of chlorid of calcium, and thereby the deaths in jaundice patients were reduced to less than one-fourth.

Further, as a result of the Rowntree-Rosenthal test of liver function through the elimination of injected dyes, we can know before operation the functional capacity of the liver, and can take measures to rehabilitate it. We surgeons are vitally interested in this work.

DR. WALTMAN WALTERS (Rochester): These parallel tests of hepatic function which have been reported by Doctors Greene and Snell are interesting not only to the clinician but to the surgeon, since it has been possible to use the Rowntree-Rosenthal test in estimating the surgical risk of patients with obstructive jaundice. For years the operative mortality in cases of obstructive jaundice has

varied from 10 to 15 per cent. Indeed a surgical mortality of 30 per cent has been reported by some surgeons following operations on jaundiced patients. Following a method of pre-operative preparation first begun at the Mayo Clinic by Hallenbeck, and extended by Giffin, Bell and myself, the mortality rate on jaundiced patients following operation has been reduced approximately to 4 per cent. This method of preparation was described before the Section on Surgery of this Association in 1922.

Careful analysis of the causes of death of the 4 per cent of patients with obstructive jaundice who do not recover following operation, reveals the fact that the majority of them die from renal insufficiency as a result of failure adequately to relieve the obstruction in the common duct at the time of operation. Besides these patients there are some who present a clinical picture following operation entirely different from that of renal insufficiency; a syndrome which Parham suggests may be due to hepatic insufficiency. The practical value of the Rowntree-Rosenthal test is applicable to the latter group of patients, for it enables the prediction of the approximate amount of hepatic damage prior to operation, thus affording information of value.

DR. CARL HARTLEY GREENE (Rochester): Mr. Chairman, this is indeed an interesting subject, as shown by the recent symposium before the British Medical Association where some of these points were discussed in greater detail than has been possible here. The serum bilirubin and the phenoltetrachlorophthalein test show changes in different phases of the activity of the liver. Each is valuable, but in final analysis decision should be made on the basis of the combination of the two tests, rather than on either one alone. The differences between some of our conclusions and those of Rosenthal and others using the dye test exclusively may be explained by this means.

We should study subjects of this sort from a physiological point of view, from a pathological point of view, from a laboratory point of view, from a surgical point of view, and from a clinical point of view. It is only by a combination of these different lines of attack that medical problems as complicated as these may be solved.

COLLOIDAL GOLD NOT ACCEPTED FOR N. N. R.

"Colloidal Gold" (Kahlenberg-Klaus Co.) is claimed to have been developed by Professor Louis Kahlenberg, of the University of Wisconsin, and Dr. Edward H. Ochsner, of Chicago. The chief advertising matter is a circular which states that the remedy "has proved to be far superior to x-ray and radium in the treatment of inoperable cases of cancer and also as post-operative treatment." The solution is claimed to contain one one-thousandth of one grain of pure gold in colloidal form in every ten drops. The remedy is sold in four-ounce bottles at \$5.00 per bottle. Calculation shows that the value of the gold in a bottle is less than one cent. In response to a letter from the Council on Pharmacy and Chemistry asking for evidence to substantiate the claims for the preparation, the manufacturer referred to an article by Dr. E. H. Ochsner. The article contains reports of four cases. In but one of the four cases was the diagnosis proved by microscopic examination and

death from cancer indicates that the colloidal gold had no effect on the disease. In the other three cases there was no microscopic examination of the tumor. Every surgeon and pathologist of wide experience knows how misleading the gross appearance of tumors may at times be. It is almost inconceivable that a serious investigator of a method of treating cancer should have neglected such an obvious and simple means of controlling his work. Until more critically studied cases, supported by microscopic examination of the tissues, are reported, in which there has been definitely demonstrable retrogression or disappearance of the tumors, the Council on Pharmacy and Chemistry sees no reason for believing that "Colloidal Gold" offers anything more in the treatment of carcinoma than do the other colloidal preparations that have preceded it. The Council found "Colloidal Gold" inadmissible to New and Non-official Remedies because the claims advanced for it are unwarranted. (*Jour. A. M. A., Jan. 31, 1925, p. 387.*)

SURGICAL SIGNIFICANCE OF HEPATIC FUNCTION*

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In order to study hepatic function in disease it is necessary to bear in mind the more important physiologic activities of the liver in health, for it is from these that we form our measure of comparison in disease. In contrast to the kidneys the liver has many functions. Consequently no one test of hepatic function will obtain the same degree of accuracy as the tests of renal function, and yet it is perfectly possible to obtain an approximate comparative estimation of such function by a single test. The test, to be of practical value, must be simple, and, in a histopathologic comparison of hepatic tissue, show a definite proportion of increased or decreased hepatic function.

It has been determined, both experimentally and clinically, that the Rowntree-Rosenthal tetrachlorophthalein test most nearly meets the foregoing requirements. In this test 5 mg. for each kilogram of body weight of the dye is injected intravenously. An hour later 5 c.c. of blood is drawn from one of the superficial veins, and the dye remaining in the blood serum is compared with standard solutions containing various known amounts of the dye. This comparison allows the determination in percentage of the amount of dye in the blood serum; normally but 3 per cent of the dye should remain in the blood serum at the end of one hour, and none at the end of two hours. Snell, of the Mayo Foundation, using the Rowntree-Rosenthal tetrachlorophthalein test in experimental animals in which obstructive jaundice had been produced, has clearly shown that as jaundice progressively deepens the tetrachlorophthalein retention in the blood increases. During the course of some of his experiments on animals the obstructive jaundice has been relieved surgically, and with the decrease in jaundice there has been a proportionate decrease in the dye retention in the blood. Those interested in the quantitative determination of jaundice in patients and in animals can make it accurately by the van den Bergh method of measuring the amount of bile pigment in the blood

serum. As one would expect, with an increase in jaundice, there is an increase in bile pigment in the blood, and with a decrease in jaundice, a decrease in the amount of bile pigment in the blood. A comparison between the amount of bile pigment in the blood and the retention of the tetrachlorophthalein dye in the blood stream shows the same ratio; namely, the greater the jaundice, the greater the amount of bile pigment in the blood, and the greater the retention of the phenoltetrachlorophthalein in the blood stream.

Counsellor, of the Mayo Foundation, studying sections of liver from jaundiced animals, and specimens of liver removed at operation from patients with obstructive jaundice, believes that there may be a definite ratio between the number of abnormal hepatic cells and the amount of retention of the tetrachlorophthalein in the blood stream.

It seems reasonable to believe that tests of the glycogenic or sugar-storing function of the liver might serve also as an index of hepatic function. Attention was first called to such a test in 1901 by Strauss, who gave 100 gm. of levulose by mouth to patients with hepatic disease and found that levulose appeared in the urine of 90 per cent because the diseased liver could not store or utilize the entire amount. Churchman, using this test, obtained a positive test of impaired hepatic function in 25 per cent of normal subjects. Improvement in biochemistry, permitting quantitative estimations of blood constituents, has enabled us to extend our knowledge of such organs as the kidney, liver and spleen, which heretofore depended on laborious and inaccurate methods of collecting the excretory and secretory products from these viscera. Bodanski, studying blood sugar in animals, has found the levulose test to be of value. Snell has obtained a positive levulose test for liver dysfunction in dogs with obstructive jaundice, which appears on the sixth day following obstruction of the common duct and continues until death. Greene, using the levulose test on patients with obstructive jaundice, decided that the test was of little value because of variable results in similar cases, possibly due in part to the fact that patients with obstructive jaundice have variable unmeasurable changes in the pancreas tending to upset sugar equilibrium.

The exact rôle of the liver in the metabolism of proteins is not well understood. Mann has shown that on removal of the liver there is a decrease in

*Read before the Minnesota State Medical Association, St. Cloud, October 8-10, 1924.

the amount of urea in the blood. In our experiments on animals with obstructive jaundice it was noted that the amount of urea in the blood was within normal limits. The same is true of patients with obstructive jaundice until just before death, when, with the advent of renal insufficiency, a rise in blood urea occurs, a point to which Parham directed attention in 1922.

Unfortunately, we have as yet no method of measuring accurately the amount of bile salts in the blood, but are looking forward to the time when such a test will be found.

In a comparative study of these various tests of hepatic function of more than 100 patients and twenty-five dogs with obstructive jaundice, made by Snell, Greene and Counseller, the Rowntree-Rosenthal test has proved itself to be of practical value.

The surgical value of tests of hepatic function is self-evident. During the last three years approximately 150 patients with obstructive jaundice have been successfully prepared for operation at the Mayo Clinic by the method described in 1921, of preventing postoperative bleeding by intravenous injections of calcium chlorid, which has lowered the former operative mortality from 9 to 3.5 per cent.

The 3.5 per cent of patients with obstructive jaundice who die after operation, die, in most instances, from a terminal renal insufficiency, due to failure to relieve the common duct obstruction adequately at operation. A few of this group, however, do not die from terminal renal insufficiency, but from a syndrome which Parham described as hepatic insufficiency.

I believe that the Rowntree-Rosenthal test of hepatic function, and the van den Bergh test of the amount of bile pigments in the blood, will afford valuable aid in formulating surgical judgment, and in managing patients with obstructive jaundice. It is only a start, but a running one, in the study of hepatic function.

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DISCUSSION

DR. A. A. ZIEROLD (Minneapolis): The matter of liver function which Dr. Walters presented to you is, as he told you, not completely or adequately worked out as yet, because of the first difficulty in determining exactly the function of the liver. It struck me in listening to him that it was still a question of what function tetrachlorophthalein represented, and that probably it was more nearly a test of liver damage than it was a test of liver function, inasmuch as it paralleled the excretory mechanism of the liver. As I recollect, Snell and Greene paralleled the excretion of tetrachlorophthalein with the excretion of bile. If that is the case it is a question whether it is of any greater value in obstructive jaundice than the simple van den Bergh which shows the bile concentration in the blood serum. In this regard I would like to mention the work of Dr. McCartney in the Department of Pathology at the University of Minnesota relative to obstruction and jaundice. He says, largely upon work that he had done and I believe some work that Dr. Bell had done previously, that there was almost a parallel between the degree of obstruction and the amount of liver damage.

One thing I would like to ask in relation to the tetrachlorophthalein is whether it has served so far as a differential point between those cases of jaundice that are purely obstructive and those that are not essentially obstructive jaundice; that is, can you differentiate between hemolytic and obstructive jaundice? There it would seem to me of value in the early type. In going over some of Rosenthal's work and some of the subsequent work that has been done with this dye, it seems that the cases in which the tetrachlorophthalein would be of greatest value are the early cases, and unfortunately, like most cases of laboratory examination, in the early cases and in the border line cases the factor of error is the largest—that is, the elimination of dye in the first hour is the time when variation is the largest—and as far as I am able to learn the limits of

normal variation in this period have not been established. I do not wish to appear hypercritical and I would avoid the too common attitude of destructive criticism that frequently cloaks a limited understanding of the subject in hand, because I believe that anything which will add to the knowledge of the extent of liver damage would be of tremendous value. Nevertheless I think each departure should be carefully scrutinized to determine whether we are not going to a bit more trouble and not finding a great deal more than would be found by the simple test which shows bile in the blood serum.

Finally, the matter of liver insufficiency: I do not believe this would be substantiated by the physiologists. Individuals may die with considerable liver damage, but I believe that the animals and the men who die with liver damage may die *with* liver insufficiency but not *because* of liver insufficiency. Now I may be misconstruing Dr. Walters' statement, but for me in view of the tremendous reserve it is very difficult to conceive of a clinically demonstrable degree of hepatic insufficiency. After all, the greatest question that arises in my mind is whether dye excretion is not more a measure of liver damage than liver function. Time alone will determine its clinical value.

There is one thing to be said for it: it will give a more uniform value, and once the limits of error have been established, those men who have the opportunity of a large series that Dr. Walters has and the controls that he has, will be able to present something that will give a more exact idea of function.

DR. A. C. STRACHAUER (Minneapolis): We are greatly indebted to Dr. Walters for his very practical and extremely valuable work in the preoperative preparation of jaundiced patients. That work has resulted in the saving of lives of patients and, I believe, in the prolonging of the lives of surgeons by lessening their load and burden in this particular field of surgery.

As to the test which he has presented, I am not going to indulge in a lot of wind-jamming and waste of your time because I personally have not had any experience with the test. However, I want to express my appreciation of the efforts that are being made in increasing our knowledge in this field. I have the rather conceited feeling that as a profession the surgeons have pretty well gone the limit as far as technical aspects of the surgery of obstructive jaundice are concerned, and it is only as the result of efforts of this sort that improvement is to be expected. I was especially pleased to have Dr. Walters emphasize the importance of complete, thorough surgery.

We have a very valuable test in every case of the liver function at the time of observation of the patient by the symptoms and the picture which he presents. Clinically we know the inadvisability of operating upon these cases when they are not in good condition. We are altogether too hasty in operating upon these patients. Our results would be infinitely improved if we would frequently postpone surgery and by proper management—the Walters preparation, the forcing of fluid by hypodermoclysis, even transfusion if necessary, the feeding of carbohydrates, gruels and that sort of thing, the application of hot compresses over the abdomen and particularly over the liver—tide the patient over until the extra hazard of surgery has

been removed. The cases of carcinoma of the head of the pancreas and of the ampulla will not be injured by this waiting, and we will find that most of the rest of the cases can be operated upon under favorable circumstances.

DR. WALTMAN WALTERS (Rochester): I am very glad indeed to have Dr. Zierold discuss my paper. Dr. Zierold, as you know, is interested in this type of case, and he has done a great deal to advance our knowledge along this line by studying the amount of bile pigment in the blood stream in its relation to blood coagulation. I believe he is quite right about the Rowntree-Rosenthal method being a test of hepatic damage rather than hepatic function. It is a point which is well taken, and I should like to emphasize it, because after all it is the amount of damage which determines our judgment as to the surgical procedures that should be employed.

The test that Dr. Zierold mentioned, the van den Bergh test, is a splendid one for estimating the amount of bile pigment in the blood stream, which bears a proportionate relationship to the amount of retention of the tetrachlorophthalein when obstructive jaundice is present. There is, however, an exception to this rule in the group of cases in which there are degenerative changes in the liver without jaundice. For instance, the case of the doctor I mentioned: the amount of bile pigment in the blood serum was small. He did not have obstructive jaundice. His liver just wasn't making the bile, and the tetrachlorophthalein test stood out as of value because it showed a tetrachlorophthalein retention grade 4 (basis of 1 to 4) and a maximal degree of degeneration in the liver. In that group of cases in which there is hepatic damage, without obstructive jaundice, the tetrachlorophthalein test is, I believe, the most valuable.

After the obstruction has been removed from the common duct and the jaundice has subsided, the amount of bile pigment in the blood serum returns to normal within a period of three or four days, but the amount of dye retention in the blood, being proportionate to the amount of degeneration in the liver, continues to show such damage for periods varying from weeks to months. I have seen several patients with obstructive jaundice who have had stones removed from the common duct in whom the jaundice and serum bile pigment returned to normal in from two to three weeks, yet the Rowntree-Rosenthal phenol-tetrachlorophthalein test showed that hepatic damage was still present. Dr. Rosenthal has shown, in his paper presented at the American Medical Association this spring, that the patient with a cirrhosis of the liver has retention of the dye in the blood stream proportionate to the cirrhosis present. It is true that all patients with obstructive jaundice also have a variable degree of cirrhosis. Here again the value of the tetrachlorophthalein test is shown.

The limits of normal variation of the amount of dye in the blood serum, I believe, are fairly accurately determined. Piersol and Bockus in their article in this week's *Journal of the American Medical Association*, Rosenthal in his article, and Snell and Greene in their work, have shown that the amount of tetrachlorophthalein in the blood serum at the end of one hour does not exceed 3 per cent in normal cases, and at the end of two hours the dye is

entirely out of the blood serum, so that we have a fairly accurate basis of comparison.

With regard to urea and the liver: Mann of the Mayo Foundation finds a diminution in blood urea after the removal of the entire liver in dogs. In other words, we have reason to believe that one of the functions of the liver is to utilize amino acids of the split protein, deaminizing them, and excreting the waste as urea in the urine. In fact, Rowntree and Hurwitz, several years ago, suggested this as one method of determining hepatic function. When there was an increase of hepatic damage they found an increase of amino acids and ammonia in the urine, and a decrease in urea, whereas the opposite should be true in cases in which the liver is working normally.

SAN-GRI-NA

"San-Gri-Na is the formula of a French physician. It has been used in Europe by millionaires, actresses and hundreds of fat men and women because it is simple, easy, pleasant and harmless." Thus runs part of the advertising claptrap for San-Gri-Na, one of the recent entrants to the "obesity cure" field. The preparation is put out by the "Scientific Research Laboratories," New York City. The newspaper advertisements convey to the obese public the idea that it is unnecessary to exercise or diet, the only desideratum being the purchase of San-Gri-Na. When the stuff has been bought, however, the purchaser finds that in addition to San-Gri-Na she should take the juice of one lemon in a glass of warm water every morning, chew her food very thoroughly, eat only two or three light meals a day, sleep not more than six or seven hours, do a reasonable amount of walking, take no liquid with meals, avoid starches, fat and candy. From the analysis of San-Gri-Na in the A. M. A. Chemical Laboratory, it appears that the product consists of tablets containing sulphur and cream of tartar with a small quantity of phenolphthalein as their essential constituents. (*Journal A. M. A., Nov. 22, 1924, p. 1703.*)

PAINODYNES

According to the label on the bottle, Painodynes, sold by the Wm. A. Webster Co., Memphis, Tenn., consists of "An organic compound containing Neurodyne 5 grains, Theine Citrated $\frac{1}{2}$ grain combined with triple bromides $\frac{1}{2}$ grain." The firm states that Neurodyne is "Ortho Hydroxybenzoic Acetic Acid Ester" and that the compound used is of the highest degree of purity. "Ortho Hydroxybenzoic Acetic Acid Ester" is a ridiculously long drawn out name for acetylsalicylic acid. Tests made in the A. M. A. Chemical Laboratory indicated the presence of this substance in Painodynes; the tests did not confirm the claim that the product used was of the highest purity. Furthermore, the Laboratory was unable to find any citrate, although "Theine citrated" is. These discrepancies are not surprising, as the firm has pleaded guilty a number of times to the charge of adulteration and misbranding. Painodynes belongs to the class of irrational shotgun mixtures marketed with unwarranted claims. (*Journal A. M. A., Nov. 22, 1924, p. 1705.*)

THE TREATMENT OF CONGENITAL CLEFT LIP AND PALATE

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The child that is born with a congenital defect is most frequently seen either at birth or a short time after by the attending family physician. It naturally follows that the family physician is the first individual called upon to offer advice concerning treatment. This throws upon his shoulders an exceedingly important responsibility. It is unfortunate for all concerned that world-renowned specialists in the treatment of these afflictions have not as yet come to an agreement regarding the standardization of the most efficient method for their management.

Perhaps the reason for this is not far to seek. It may probably be explained upon the basis that the results obtained by any method of treatment yet devised offer a fair measure of success in a percentage of cases far below one hundred. It is probably also true that in the hands of the expert the methods of treatment of which he is master give comparatively good results, whereas he may have found the methods of others less efficient in his hands. The comparative rarity of these conditions, combined with the willingness of those who have had no special training in their treatment to attempt their management, has resulted in an exceedingly high percentage of failures or partial failures. Furthermore, we must all realize that the successful management of cleft lip and palate cases is a difficult procedure.

To one of our own countrymen, Dr. Truman W. Brophy, should go the greatest credit for the early recognition and persistent reiteration of the fact that cleft lip and palate offer such extreme difficulty to their correction on account of the great underlying factor of bony diastasis which he considers of much more importance than the simple separation of the soft tissues. It is also through Brophy's teachings that we have learned that after overcoming the bony displacement the reestablishment of the soft parts becomes a much simplified procedure. It is unfortunate that the teachings of this master are so little understood and that therefore attempts at carrying out his methods have not infrequently been unsuccessful.

If one of Brophy's premises is correct—and this

is borne out by many observers, notably by Sir Edwin Keith of the Royal Museum of England—there is at birth but a slight loss of tissue in the upper jaws of the child who is afflicted with a complete cleft palate. Mr. Keith found, after the examination of numerous specimens, that the variation in the combined width of the tissues of the separated halves of the palate was uniformly within 3 millimeters of that of the normal. Soon after birth, however, through failure of continued

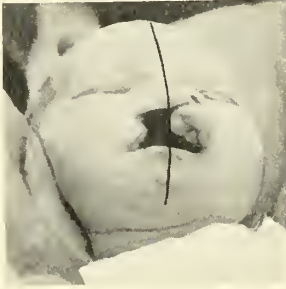


Fig. 1. Showing lateral deviation of the nose in an infant born with a unilateral cleft lip and palate.

normal development, the difference in width becomes more appreciable. Brophy observes furthermore that after thorough apposition and union of the cancellated bone of the opposing bony processes has been established the growth of the palatal structures progresses approximately normally.

segments of the palate. In other words, any force which tends to approximate *only* the anterior borders of the alveolar processes, causes the superior maxillæ to rotate around a vertical line drawn through their center. It was these factors which induced him many years ago to advocate the early reposition of the separated halves of the maxillæ posteriorly as well as anteriorly. It was on these principles that he based his objections to the preliminary closing of the lip and, as well, to all means proposed for the purpose of bringing about the same result, i. e., the approximation of only the anterior borders of the alveolar processes.

It is a matter of common observation that every individual with a unilateral cleft presents a nasal deflection toward the side to which the premaxilla is attached (Fig. 1) and that the approximation of



Fig. 4. Showing bony diastasis of the alveolar processes in a boy of seven years, whose lip only had been closed in infancy. Note here that nasal deflection was also present.



Fig. 2

Fig. 3

Fig. 2. Showing lateral deviation of the nose in a girl 16 years of age in whom the lip was closed 11 days after birth and in whom no reposition of the bones had been made. Note: This patient could place the tip of the index finger between the anterior borders of the alveolar processes. (See also Fig. 4.) The palate had not been closed.

Fig. 3. Profile view of patient shown in Fig. 2, showing the "thinning out" of the upper lip with the "fish-mouth" appearance due to causes mentioned in the text.

He also calls attention to the fact that the approximation of the anterior alveolar processes only will invariably result in a divergence of the *posterior*

the anterior borders of the alveolar processes only, no matter how it is accomplished, fails signally to completely overcome this deflection. This, to my mind, is the chief objection to depending upon early closure of the lip for the purpose of overcoming the alveolar diastasis. My case records show that over 50 per cent of the patients that I have been called upon to treat have been operated upon one or more times before coming to me. In every instance in which the lip alone had been closed in infancy, the patient presented nasal deflection (Fig. 2), a depression of the ala, absence of bony union between the alveolar processes and in many instances marked retraction of the upper lip giving the "fish mouth" appearance in profile

(Fig. 3). In a number of cases it was possible for the patient to place the distal phalanx of the first finger between the anterior borders of the separated alveolar processes (Fig. 4). In all cases the soft palate presented an extremely wide defect even though no attempt had been made at closure and



Fig. 5

Fig. 5. Cleft palate and lip-tripartite type. Showing bony diastasis of the alveolar processes in conjunction with wide separation of the nasal alae and protruding premaxilla. (See Fig. 6.)

Fig. 6. Showing a profile view of the tripartite type with inordinate protrusion of the premaxilla. (See Fig. 5.)

Fig. 6

where such an attempt had been followed by failure the diastasis was even greater.

While there are many varieties of these defects, the principles underlying their treatment may perhaps be most clearly discussed by referring only to the two main classes: First (bipartite), those cases in which a single cleft extends through the lip and palate and which are always accompanied by a marked lateral deviation of the nose (Fig. 1); and, second (tripartite), those in which the cleft in

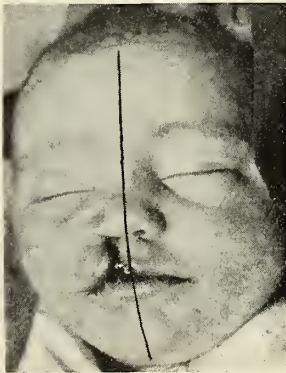


Fig. 7. Bipartite type showing the result of the Brophy wiring operation. Compare with Fig. 1. Note symmetry of face after bony reposition has been established.

the lip is double, the premaxilla being separated from the alveolar processes on both sides. In this latter class the premaxilla usually protrudes inordinately (Figs. 5 and 6). The nose is broad and depressed but is not deflected to either side.

In either instance the surgeon is confronted with the necessity for carrying out three distinct procedures, as follows: The establishment of a normal bony union bringing the separated portions of the superior maxillary bones into apposition (Figs. 7, 8 and 9), the union of the separated segments of the lip and the union of the structures of the soft palate.

Suggested method of procedure: Readjustment of the displaced bones. We are unqualifiedly in favor of the method advocated by Brophy for the early bony reconstruction of the upper jaw. The ease with which this procedure may be carried out will depend a great deal upon the age at which the child is admitted. Brophy puts the limit at about six months and it is well known that the operation is much simplified in the early weeks of life when the bony tissues are easily restored to their normal position. From three to six weeks of age would seem to be the ideal period in which to carry out this procedure. At any time, up to the age of six months, the separated bones may be forced together by compressing the upper jaws



Fig. 8

Fig. 8. Tripartite type, showing the result of the Brophy wiring operation. Compare with Figs. 5 and 6. Note the resulting narrowing of the nose and the normal position of the premaxilla.

Fig. 9. Profile view of Fig. 8 after lip operation. Note the extreme thickness of the upper lip.

Fig. 9

after freshening the borders of the alveolar processes and, in the tripartite type, the borders of the premaxilla as well. The parts may be held in normal position by means of silver wires and lead plates. The wires should be allowed to remain about eight weeks and even longer if in the interim failure of approximation takes place, under which circumstances the wires should be readjusted in order to insure the approximation. The causes of failure in attempting to carry out the Brophy technique have, in our observation, been due to three main factors. First, the failure to pass the wires

sufficiently *high* or in other words a sufficient distance *away* from the tissues of the palate; second, failure to pass the *posterior* wires sufficiently far *back*; and third, the attempt to move the bones into approximation by *twisting* the wires (in which case the latter are extremely likely to break) instead of

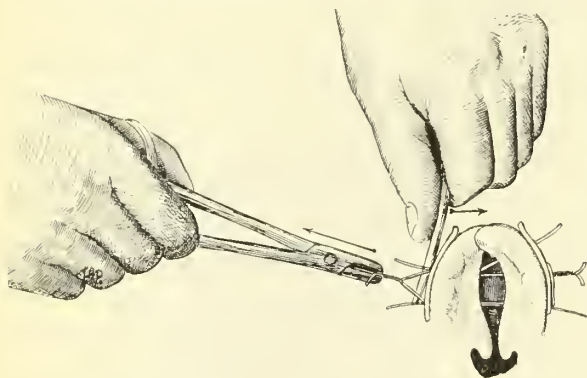


Fig. 10. Showing the position of the wires and lead plates in the Brophy operation. Note the method of overcoming the diastasis by making traction upon the wires and counter pressure upon the lead plates by means of the Kocher director.

bringing about the approximation by *external pressure* combined with *traction* upon the wires, which is facilitated by making pressure upon the lead plate with a Kocher's director, after which the wires are simply twisted upon each other to a degree which only "takes up the slack" (Fig. 10).

The age for this procedure, as stated above, is under six months and the desirable age from three to six or eight weeks. After bony union has taken place, the wires may be removed and the lip united. We usually remove the wires and unite the lip at one sitting.

The underlying principles of treatment of the tripartite type of cleft lip and palate differ but slightly from the single form. Here, while the lateral nasal deflection is absent, the protruding premaxilla and the depression of the nose offer problems the solution of which often tax the surgeon's ingenuity to the utmost. The great mistakes which have been apparent in the unsuccessful cases coming under our observation have been due mainly to failure to overcome the wide separation of the superior maxillæ during infancy and *especially* to the *removal* of the *protruding premaxilla*. Another mistake less grave, which one often sees, is the result of forcing the premaxilla too far posteriorly, a maneuver which also results in the "fish mouth" deformity. Where the premaxilla is allowed to remain and the lateral halves of the supe-

rior maxillæ are not brought closely enough together, this deformity is sure to result. We believe that the ideal procedure is to narrow the bony diastasis in early infancy, freshen the anterior surfaces of the premaxilla and at once reconstruct the bony arch of the upper jaw, holding the segments in place by means of silver wire and lead plates (Figs. 8 and 9). As Brophy states, this allows the normal development of the upper jaw and offers a most excellent opportunity for the later closure of the soft palate, which is always a most difficult procedure. Upon the removal of the wires and plates the upper lip may be repaired and if sufficient undermining is carried out the nasal depression may be overcome (Figs. 9, 11 and 12). Recently we have divided the lower end of the septum as an aid in elevating the nose, with gratifying results.

CLOSURE OF CLEFT LIP

Many ingenious methods have been devised for overcoming this deformity. We will refer but briefly to some of the fundamental points. The procedure of Owen is a most excellent one because of its two main essentials. First, it most effectually guards against the "notch," which is a not infrequent sequel to operation. Second, the carrying out of this procedure necessitates incisions more or less transversely across the lip. Such incisions



Fig. 11

Fig. 12

Fig. 11. Showing symmetry of nose immediately after closure of single cleft lip, eight weeks after Brophy wiring. Compare with Figs. 1 and 7.

Fig. 12. Showing symmetry of nose and normal thickness of lip some years after Brophy wiring and lip repair. Compare with Figs. 1 and 7.

reduce to a minimum the unsightliness of a resulting scar. The objectives to be aimed at are symmetrically shaped nostrils (Figs. 11 and 12) (and here it should be remembered that the size and

shape of the nose of an individual is of much less importance than is its symmetry), and, second, a lip of generous length and thickness. The length of the lip may be made entirely dependent upon the amount of "undercutting" and the carrying of incisions around the nasal alæ. Thickness may be increased by dividing the lip on a slant while freshening the borders or by a method which we have been attempting to perfect for a number of years.

In all work upon cleft lip, the late results should be anticipated and considered more important than the actual cosmetic result obtained at the time of operation. It should be remembered that it is a comparatively simple matter to remove a small amount of redundant tissue later and that secondary undercutting must necessarily deal with scar tissue with its attendant difficulties.

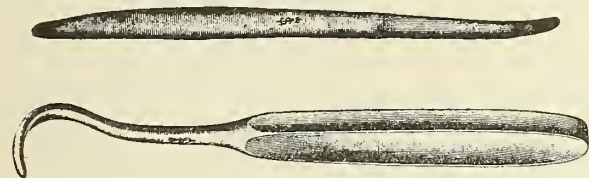


Fig. 13. Showing elevators used in freeing muco-periosteum preliminary to closure of cleft palate.

CLOSURE OF THE SOFT PALATE

Provided a case has received the proper early management, the closure of the soft palate is not necessarily extremely difficult. The ideal time is perhaps between the fourteenth and eighteenth month, when the child has not yet begun to talk, but has gained strength and vigor and when the mouth has increased in caliber. The technical factors which make for success in this part of the procedure are a good exposure, an extremely gentle technic,

avoidance of lateral incisions, adaptable instruments and appropriate suture material, which should be placed at the proper tension. In addition to the usual instruments we have found the elevators (Fig. 13) exceedingly useful. Wide freeing of the muco-periosteum is essential, as is the conservation of the blood and nerve supply. We have never found lateral incisions necessary in cases which have not been neglected or previously operated upon. Horsehair is the suture material of choice and we have found preliminary massive infiltration with weak novocain solutions an aid in raising the flaps.

Time will not permit a discussion of the importance of having every patient in the best possible physical condition for operation nor the great part which the after-treatment plays in bringing about success.

To summarize: We believe that the most important procedure in complete cleft lip and palate is the *early restoration* of the *bony maxillary arch*; that the ideal time for making this restoration is between the third and the eighth week, and that it should always be done before the child is six months old; that the cleft lip should be operated upon before the child begins to talk, or between the fourteenth and eighteenth months; that when these procedures are carried out in consonance with the principles herein enumerated, the results of treatment will be greatly improved and that operations upon the neglected cases and those which have resulted in partial failure will less frequently be found necessary; and, finally, that the extreme importance of the parents of these unfortunate children receiving proper advice from their family physicians cannot be overemphasized.

HOYT'S GLUTEN FLAKES NOT ACCEPTED FOR N. N. R.

Hoyt's Gluten Flakes is marketed by the Pure Gluten Food Co., New York, as a ready-to-eat gluten preparation. The claims are made that it is "a perfect gluten," that it contains "40 per cent protein," which is asserted to be the government standard for gluten, and that it is "free from starch." These statements of composition are misleading. A product containing 40 per cent of protein is not a "perfect gluten" nor is 40 per cent the government standard for gluten flour, but the lowest limit of protein to which the term gluten flour may be applied without incurring danger of prosecution by the federal authorities. The Council on Pharmacy and Chemistry declared Hoyt's Gluten Flakes inadmissible to New and Non-official Remedies because (1) its composition is not correctly declared and (2) the claims

for its effects on nutrition and health are unwarranted and misleading. (*Jour. A. M. A., Jan. 3, 1925, p. 53.*)

CALCREOSE WITH IODIN

The Council on Pharmacy and Chemistry reports that Tablets Calcreose with Iodin are unacceptable for New and Non-official Remedies because the composition of the product is unscientific, and its use is, therefore, inimical to the interests of the public and the medical profession. The Malbie Chemical Co., which markets the tablets, claims that each tablet contains calcreose 4 grains, and iodine 1/30 grain. The use of the tablets by the physician would mean that the patient in addition to the required dose of iodine would also have to take the creosote compound, calcreose. The creosote compound might be superfluous or contraindicated. (*Jour. A. M. A., Jan. 31, 1925, p. 388.*)

NEWER IDEAS OF INFECTION IN NERVOUS DISEASE *

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In preparing to present the newer conception of the rôle of infection in nervous disease one finds an unlimited field. The subject is so broad and its scope so vast that a detailed discussion in a short time is impossible. It is the object of this paper to review and to emphasize the recent advances in this very important branch of medicine and to point out in a general way their practical value. It shall cover not merely focal infection in its different forms but infective processes in general, including acute and chronic infectious diseases, with their consequent good or bad effect upon the nervous system. And it must necessarily embrace both organic and functional nervous diseases as well as disorders of mentality.

In order to appreciate fully the pathological processes involved, there are two factors of great importance to be considered: first, the fact that the tissues of the nervous system respond to infective processes just as any other tissues of the body do; second, the fact that there are various pathways whereby infection enters the nervous system.

With reference to the first factor, it may be said that the central and peripheral nervous systems are subject to inflammation, accompanied by congestion, infiltration and edema, resulting often in degeneration with disintegration of function, as are all the other vital organs. This process may be acute and rapid or chronic and slowly progressive. It may be due to direct bacterial invasion, as in cerebro-spinal meningitis, or to the toxins liberated by bacteria elsewhere in the body, as in tetanus, or it may be caused by non-bacterial agents such as drugs and alcohol. The degree of involvement of the nervous system does not depend necessarily upon the location or size of the exciting focus. Illustrative of this fact is a case recently seen in consultation with Dr. E. H. Norris of St. Paul. The patient, a mail-carrier, received a prick in the heel of one foot from a nail in his shoe. There developed a small circumscribed area about the

size of a split pea, and yet when first seen this man had a tetanic contraction of practically every muscle in his body—including even the spinal group.

The pathway by which infection most frequently enters the central nervous system is by way of the air passages. Under normal conditions these are guarded by the cilia of the mucosa and by the mucoid material with which the mucosa is bathed. In bacteria carriers it is found that the organisms as a rule are embedded in a mass of mucus, and in such cases the carriers themselves do not seem to develop an immunity to the organism carried. This fact is evidence that there has been no systemic effect of the presence of these organisms. It is logical to suppose that any condition arising to cut down the normal amount of mucus secreted or to interfere with the proper functioning of the cilia, predisposes to infection of the central nervous system by rendering less effective these sentries of the airways. A break in continuity of the mucosa itself completes the route for invasion. The common infections entering in this way are poliomyelitis, meningitis of all kinds and epidemic encephalitis. In the latter, though the causative factor is as yet unknown, we feel justified in the assumption that it is a respiratory infection because of the fact that the greater percentage of cases are preceded by some acute pathologic process in the nose or throat.

In addition to the respiratory tract, the blood and lymph channels are highways of infection for the nervous system. Not only do they function as such after a break in the respiratory mucosa occurs, thereby allowing infection to enter, but they are pathways for infection from sources in outlying parts of the body. For instance, in tetanus the intoxication takes place through both blood and lymph channels and can be demonstrated experimentally in the blood, even in its earliest stages. Marie, Meyer and Ransome have shown that the toxins of tetanus are carried from the initial lesion to the blood by the lymphatic system, then by the blood to the motor end plates and finally by the efferent nerves to the spinal cord. The nerve sheaths are the actual transmitters of the toxins, and in experiments, if the efferent nerves are cut, fatal dosage of tetanus may be given with no cord involvement at all.

Foster Kennedy, in a recent article, draws attention to the fact that trismus, through irritation of the motor root of the fifth nerve, is one of the

*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, Minn., October 10, 1924.

earliest symptoms of a generalized tetanus, even when the infection is in the lower extremities; that in post-diphtheritic intoxication, oculomotor paralysis is a fairly constant feature, no matter where the infecting focus is, and that early in epidemic encephalitis we find the third nerve nuclei infected. He regards these phenomena as evidences of blood-borne infection, and suggests that their occurrence may be due, not alone to the special delicacy of their structure, but to "pathways of invasion not yet understood."

Added to these avenues of entrance to the nervous system is a fourth—that of direct extension from the mastoid, the middle ear or the sinuses of the skull. This is demonstrated by the occurrence of brain abscesses or infections secondary to otitis media or mastoid or sinus disease.

Having established the fact that the nervous system is subject to infection, and having pointed out the paths whereby the toxins enter, let us now consider what the effects of infection upon the nervous system are and of what value it is to us to understand them.

First, *focal infection*. For the past few years the medical profession has been demonstrating its interest in this field. The pendulum has swung from conservatism to radicalism and now in its inevitable way is swinging back again. There have been enthusiasts who advocated the indiscriminate pulling of teeth—and so we see young men and women of twenty-five or thirty wearing one or more plates. Others have insisted that the tonsils must be the root of all evil and have advised the removal of these organs "ad libitum." Pages might be written on this, but time does not permit. We have all seen startling recoveries from neuritis, from functional nervous disorders and from psychoses following the extirpation of focal infection. The writer has recently seen three cases of violent insanity clear up almost miraculously, two following the extraction of badly abscessed teeth and one following the removal of diseased tonsils. He has also recently seen a mental case clear up following treatment of a severe Vincent's angina. The ordinary toxic psychosis resulting from Copenhagen snuff is promptly relieved when the snuff is withdrawn. On the other hand, we see many cases of neuritis where we cannot find a focus of infection and where abscessed teeth, infected sinuses or diseased tonsils do not exist. Also there are many cases of insanity where the removal of concrete

foci of infection has no apparent effect upon the mental condition.

In the *American Journal of Psychiatry* for October, 1923, is a very comprehensive study of focal infection in mental disease by Kopeloff and Kirby. In a series of 120 cases under their observation, they reach the conclusion that the removal of foci of infection did no good and that focal infection is not the etiological factor in functional psychoses.

Cotton believes that the presence of bacteria in the gastric contents is evidence of focal infection and a cause of mental disease. Still others* assert that all cases of dementia precox and manic depressive insanity are due to intestinal infection and that the symptoms of mental disease will all disappear following the proper treatment of this intestinal condition, but they tactfully admit that they do not know just what "this proper treatment should be."

We cannot agree with any of the above. Definite relief of neuralgia and neuritis does occur often following removal of diseased teeth and tonsils or following the cleaning up of infected sinuses. Also serious neurological disease may follow gastro-intestinal infection.

The writer has under his care at present a young man with a multiple neuritis involving all extremities. There is pronounced nerve trunk tenderness, extensive atrophy of all muscles in both upper and lower limbs, with some foot-drop and great weakness. This condition came on secondary to a severe gastro-enteritis which followed the eating of a piece of blueberry pie made of canned blueberries. Other members of the family suffered the gastro-intestinal disorder, with pain, nausea, vomiting and diarrhea, but the patient is the only one in whom a neuritis developed. We believe that there is a rational "middle ground" on which to take our stand in this matter. Focal infection is most assuredly a contributing factor in the causation of nervous disease. One of the great advances in neuro-psychiatry in the last few years is the recognition of the fact that chronic infection plays an important part in the so-called "functional neuroses." These are the patients who wander from one doctor to another, complaining vaguely of indefinite pain and queer sensations, of "blue spells" and insomnia and of lassitude and discontent. Little sympathy and less attention is what they usually receive.

*C. B. King (Chicago), *Illinois Medical Journal*, February, 1922.

It is our custom to examine routinely the nose, throat, teeth, sinuses and tonsils of all patients who come to us. If abscessed teeth are found, if diseased tonsils, infected sinuses or deficient air passages are discovered, we believe the condition found should be corrected. Pus pockets anywhere are detrimental to good health in general. We do not attribute to these alone the cause of all nervous disorders, but we believe they are contributing factors which should be removed as a matter of hygiene and for the best interest of the patient, whether his disease be functional or organic.

One would like to discuss infection in its relation to chorea, a disease so common, in which the removal of all foci is of the utmost importance; also in regard to epilepsy, special stress being laid on its occurrence secondary to influenza and encephalitis; and to myelitis, which follows acute infections far more frequently than is commonly supposed. Only a month ago a case was seen in consultation with Dr. G. K. Hagaman of St. Paul, of complete transverse myelitis in the lower dorsal region in a child six years old recovering from tetanus.

Time and space do not permit detailed discussion of these, but we cannot pass on without a word concerning influenza, that terrible scourge which left its indelible mark upon the nervous systems of many of those who suffered from it. Never in the history of medicine has there been an acute infectious febrile disease which perpetuated itself in such a great variety of sequelæ. From the mild neuroses to the lethal encephalitis, from peripheral neuritis to epilepsy and insanity, we are even yet meeting the "hang-overs" of this dread disease.

Of the chronic neurological diseases, perhaps the one best suited to discuss in relation to infection is multiple or disseminated sclerosis. Occurring with startling frequency, almost always in young individuals, insidious in its onset and deadly in its progress, it presents a very interesting problem as to cause. For the past two or three years the treatment of this disease with neo-salvarsan, mercury and the iodides—and occasionally with spinal drainage—has given the most gratifying results. Remissions are obtained repeatedly by this method in cases which have responded to no other medication. Since it responds so readily to the same treatment which is used in cerebro-spinal lues, may we not assume that this disease is caused by an organism which is a member of the spirochete fam-

ily? Marinesco has demonstrated the presence of motile spirochetes in his experiments with multiple sclerosis in guinea pigs. These were of unequal size and not of the same nature as the *treponema pallida* of syphilis. Marie, in 1887, was the first to maintain the infectious origin of multiple sclerosis. Since that time, numerous experimenters have investigated it and some have been willing to express the opinion that it is due to a specific organism; but in spite of all this work no definite conclusion as to the causation has been reached. No one as yet has been able to demonstrate such a causative agent, but the results seem to justify the assumption that such is the case.

One of the most interesting experiments in nervous disease is the one now being conducted in various places relative to the treatment of general paresis by malarial infection. The literature of the past year contains several reports of this treatment. Its principle depends upon the fact that remissions in chronic diseases may occur following the attack of an acute specific fever. The technique, as described by Templeton,* is as follows: Take from two to four c.c. of blood from the vein of a patient suffering from benign tertian malaria—whether the stage be febrile or not—and inject it subcutaneously into the paretic patient. Within a week typical malarial attacks will develop. These are allowed to run until ten or twelve have occurred, when the malaria is cured by giving quinine in the usual manner. Following the febrile stage, and at the same time the quinine is being given, neo-salvarsan is used intravenously once a week in the usual dosage. This is continued as long as is necessary to produce the desired result.

A peculiar fact noted by observers of this treatment is that during the malarial attacks there is often an acute exacerbation of mental symptoms, consisting chiefly of auditory hallucinations and delusions of persecution. In most cases it has been found that these subside promptly when the febrile stage is over. We, who believe in spinal drainage and in the use of salvarsanized serum in the sub-arachnoid space according to the Swift-Ellis method, would be inclined to follow that method of treatment after the malarial onslaught. Also we believe it would be of advantage to use the serum by intra-cisternal injection, thus bringing a more direct attack upon the diseased area.

*Brit. Med. Jour., May 26, 1923, p. 895.

That malaria in itself is not a specific for syphilis is a rational belief and though the mental symptoms of paresis may clear up phenomenally after the febrile attacks it is not necessarily a fact that there are changes in the spinal fluid findings as a result of the malarial infections alone. One author reports that the spinal fluid has returned to normal after the malarial attack but the majority find no change. Therefore we must continue to use our specific treatment until we get serological normalcy or as near it as possible. Thus we see that our acute infection is not a cure but an adjunct. Just what part it plays is a mystery. Its action may be purely to quicken the metabolic processes; to consume some of the toxic and inflammatory products in the affected brain cells with its pyrexial fire, or there may be a biological relationship existing between the spirocheta pallida and the plasmodium malariae. Suffice to say that reports of this method of treatment show a higher percentage of remissions than that obtained by any other form of therapy. But in our optimism we must not lose sight of the fact that general paresis is parenchymatous syphilis of the brain; that its pathology is a progressive degeneration of brain structure and that degenerated tissue cannot be restored. Therefore in the malarial treatment as in all other forms, early diagnosis and early therapy are imperative for success.

A curious comment upon this subject is made by Nathaniel Bercovitz of Hainan, China, in a communication published in a recent issue of the *Journal* of the American Medical Association. He observes after an experience of eight years in this territory that while general syphilis is very prevalent, neurosyphilis is rarely seen. He states also that malaria is almost a universal disease among those people and that probably all of the inhabitants harbor the parasites in their systems. He suggests that the rarity of neurosyphilis in this prevalence of general syphilis may be due to the inhibiting influence of the malarial plasmodiae. Is it possible then that we may look forward to a time when we can treat general syphilitics with malaria in the hope of preventing neurosyphilis? Ley, of Belgium, actually reports cures in 40 per cent of cases treated by the malaria method, followed by neo-salvarsan. This is a bold statement, for never yet has paresis been regarded as curable. Remission, with a clearing up of clinical symptoms for an indefinite period, has been the greatest

reward of persistent treatment. Ley's report is enlightening, and if it is the forerunner of greater progress, there is offered indeed a new hope to these condemned individuals.

Startling effects of other acute febrile infections upon disease of the nervous system are not uncommonly witnessed. This is true particularly in mental disorders. Four years ago a young man was sent to us from North Dakota, suffering from the paranoid form of dementia precox. He was a violent case, having to be kept in full restraint all the time. He made little or no progress mentally for several weeks. At the end of that time he became acutely ill with a lobar pneumonia involving both lungs. The severity of the infection can be realized by the fact that his temperature per rectum registered 112°F. Three different thermometers were used to verify this. The pneumonia terminated by crisis about the eighth day and synchronously with this came a clearing up of the mental condition. There was no return of the psychosis and when he had convalesced from the pneumonia he went home well and, as far as we know, has remained so. We cannot explain the phenomenon of a rectal temperature of 112°F., nor have we ever reported it before.

Erysipelas is a well-known infective backfire. Some eighteen months ago the writer observed for several weeks a man suffering from what was thought to be lethargic encephalitis. He was picked up on a street unconscious, was brought to the hospital and for some weeks apparently lingered between life and death, irrational, at times comatose, febrile and in every way very sick. He suddenly developed a facial erysipelas, which ran a very severe course for about ten days. As this acute infection subsided his mentality cleared, he became rational and made a perfect recovery.

These two instances serve to illustrate the beneficial effect of acute infectious processes upon brain disorders. For years there have been attempts made to establish some standard treatments involving this principle, but with no great results. Tuberculin in paresis has been faithfully tried in the hope of quickening the metabolic rate and affecting a cure. Intramuscular injections of turpentine have been used in other chronic nervous disorders, in the hope that an artificial leucocytosis so created might be of benefit, but both have been discarded.

In conclusion, the salient points which we can pick from our review of this subject are:

1. The nervous system is subject to infection like all other tissues of the body.

2. There are four main pathways of infection in the nervous system—i. e., air passages, blood, lymphatics and direct extension.

3. Infection of any kind is an important contributory cause of organic and functional nervous disease, but is not the sole etiologic factor.

4. Certain acute specific febrile infections have a curative effect upon mental disorders, but so far this has no scientific basis.

5. The use of tertian malaria in the treatment of general paresis appears to give an increased percentage of remissions.

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DISCUSSION

DR. H. W. WOLTMAN (Rochester): Dr. Hengstler's survey of this large field of more or less serious diseases, calls our attention to an earnest effort that is being made to break away from some of the traditional doctrines concerning the cause and treatment of nervous diseases, and to develop more hopeful and rational methods of therapy.

The infectious nature of such conditions as brain abscess, tetanus and syphilis is no longer questioned, but not so the causation by micro-organisms of other illnesses such as multiple sclerosis, chronic anterior poliomyelitis and transient cranial nerve palsies.

There was a time when every dropped lid and crossed eye spelled syphilis and when potassium iodid was the sheet anchor of therapy. This convenient practice is disappearing.

There is good clinical evidence for presuming that infection may be responsible for most of the diseases mentioned by Dr. Hengstler. In Bell's palsy, for example, there is often a history of an associated cold. In one case of recur-

rent sixth nerve paralysis and in another of a recurrent bulbar palsy syndrome that we had opportunity of observing, the concomitantly recurring attacks of arthritis gave striking evidence of infection.

The laboratory gives additional support to this view. Fibrillary tremors, as seen in chronic polio, hiccupping and respiratory syndromes, as seen in encephalitis, etc., are astonishing occurrences when observed in animals, yet Dr. Rosenow has reproduced these experimentally by the injection of organisms obtained from patients who exhibited corresponding phenomena.

Any measure such as the removal of foci and the administration of a vaccine that offers a possibility of arresting the progress of such sinister and fatal diseases as chronic poliomyelitis and multiple sclerosis, deserves a fair trial in selected cases.

A correct diagnosis is essential. The removal of infected foci, for example, cannot be condemned, as is often the case when it fails to banish brain tumors, trifacial neuralgia, migraine or the psychoneuroses.

The discovery of spirochetes in the diseased areas of multiple sclerosis, a finding not yet wholly confirmed, led to much speculation regarding the therapeutic efficacy of arsenical preparations. Recently we had the opportunity of making a careful search by dark field illumination of fresh material from a case of multiple sclerosis, but we were unable to find the spirochetes described by Kuhn and Steiner.

We have tried non-specific arsphenamin therapy and tryparsamid in cases of multiple sclerosis, but with uncertain results. In a few instances there was striking improvement after its use, but in these cases foci had been removed as well. It is obvious, however, that the response is in no way comparable to that observed in neurosyphilis.

Dr. Hengstler's paper is an excellent pithy and practical presentation of a very important subject, a problem that concerns all of us.

DR. A. S. HAMILTON (Minneapolis). Mr. Chairman, I do not think Dr. Hengstler could have chosen a more opportune subject than that which he has presented today. There are some very enthusiastic advocates for the influence of infections in nervous and mental diseases today. For instance, we have the dentists always with us, and some have very advanced ideas on this subject. Very recently, a dental friend of mine berated me severely because I refused to sanction the extraction of teeth in his poor old grandmother who was in a state of senile dementia.

Then we have the group represented by members in our own profession who go cheerfully on from year to year adding to their statistics in mental cases and claiming more and more for intervention by way of extraction of the teeth and tonsils, the gall bladder and large intestines, and invading the female pelvis at times and claiming to have some wonderful results. Their percentage of cures has been advanced from time to time, until now they claim something like 80 or 85 per cent of cures in the cases submitted to their care. Once, they were deterred by the problems offered by senile dementia and apoplexy and advanced mental deterioration, but even these cases are now claimed to be materially benefited.

Now, beside this possible general result of infection, we have also that specific physical effect: that is, a definite nervous condition due to direct effect upon some one par-

ticular part of the nervous system. Years ago, we used to think of poliomyelitis as a sort of thief that stole in in the night and left only a focal paralysis, with no constitutional symptoms, that neither got worse nor better. Then I remember when poliomyelitis broke out in epidemic form in Barnum and Moose Lake and we found a condition which comes on with prodromes, high fever, rapid pulse, and even such phenomena as marked convulsions and death.

Since then, we have suffered from a rather extraordinary series of infections of the nervous system. First, it was in the cord, and then it rose a little higher up and was called polioencephalitis inferior, then it was called polioencephalitis superior, and when we couldn't group all the cases under these heads, we had to use the terms sub-acute anterior poliomyelitis and chronic anterior poliomyelitis. And then, we had progressive muscular atrophy, of course, and later we developed a peculiar series of cases of multiple neuritis and myelitis, and finally we developed the present conception of encephalitis, which, at first, had a clear group of symptoms and was known as sleeping sickness on account of one of its very prominent features, but which is now manifested by almost any neurologic phenomena. In fact, we have now reached the stage that when one meets a group of symptoms involving the idea of organic changes in the brain and which we cannot otherwise associate, we are very likely to use the term encephalitis and the situation is rather bewildering. How all these conditions to which I have referred are associated with each other, I am not prepared to say, but I have never gotten over the feeling that they are associated and that, in a sense, we have progressed from one to the other. It is certain that all our recent epidemics of infections of the nervous system have shown different pictures in different localities and even at different times in the same locality.

Ordinarily, we think of infection of the nervous system as a pernicious influence but Dr. Hengstler has spoken of its possible benign effect, as, for instance, in induced malaria

and in intercurrent pneumonia and erysipelas. That malaria may greatly alleviate so deeply founded a parenchymatous syphilitic conditions as paresis, seems like an extravagant and foolish statement; yet there is abundant evidence to show that, somehow or other, infections with marked constitutional reactions may have wonderful effects upon both mental and nervous conditions. The literature on mental disease for many years past contains reference to cases where a patient has gotten well following injuries with severe pus infection and following pneumonia, typhoid, etc. Some years ago, I saw an epidemic of typhoid fever develop in a hospital for the insane. There were 286 cases of typhoid, and when one recalls that in a state hospital there are gathered a large number of patients with very bad behavior and with many maniacal conditions, I think you will agree that 286 such individuals with typhoid fever would constitute a real problem in nursing. On the contrary, I assure you that in my experience as interne in a general hospital where we had many cases of typhoid, I never saw as well behaved a group of people with typhoid fever as I saw in that state hospital for the insane and, in this latter group, many showed mental improvement which, in its rapidity of development and in its completeness, was almost miraculous.

Among the 286 cases, were 28 epileptics. All these latter were cases with mental deterioration and mostly having fits at very frequent intervals. Out of the entire series of epileptics, only two patients had one fit each during the entire period of the acute illness, though several would have averaged as much as two or three per day under ordinary conditions. Unfortunately, as soon as the symptoms of acute infection had disappeared, the epileptics, without exception, returned to their fits, and the insane mostly, but not invariably, returned to their former state of insanity. Nevertheless, I have never ceased to feel that in such conditions as typhoid fever we have a tremendous power in influencing diseases, if only we could control it.

GOITER PREVENTION

Persons affected with thyroid disturbances have been aroused to the possibilities of relief that modern medicine offers. The public has been awakened to the problems that confront many of our communities, and the medical profession has been stirred to a realization of its duties to the public in demanding the institution of safe relief measures. The enthusiasm for relief measures must not be allowed to initiate the public into unwise or unwarranted practices. The fundamental concern of the health official is the prevention of endemic thyroid enlargement. In line with this the Cincinnati Board of Health proposes to confine its work to prevention and will refer children known to have thyroid enlargement to their family physician. Iodized table salt should not be regarded as a "cure-all." It will probably not cure a simple goiter, and the primary purpose of the preparation is to aid in providing the iodine that is essential to the proper functioning of the thyroid gland in normal persons, who compose the majority of the population. The exceedingly small quantity of iodine made available in this way must be skillfully supplemented by physicians when definite thyroid enlargement exists. (*Journal A. M. A., Dec. 6, 1924, p. 1849.*)

BETO

Beto is advertised as a "Blessing to Diabetics." Like most nostrums sold for the alleged cure of diabetes, Beto is featured as a product whose use makes it unnecessary for the diabetic to diet. When first put on the market, Beto was sold and advertised exclusively as a cure for diabetes. Later, it was recommended, in addition, for high blood pressure, "all kidney troubles" and dropsy. Beto comes in the form of tablets and sells at \$5.00 per package. The A. M. A. Chemical Laboratory reports that the product may be considered to be composed of talc, 3 per cent, magnesium sulphate U. S. P., 97 per cent, and oil of cinnamon, a trace. Each tablet was equivalent to approximately 7 gm. of Epsom salt, or one-half the dose given in the U. S. Pharmacopoeia. Thus the purchaser of Beto pays \$5.00 for 1½ pounds of Epsom salt, which can be bought for 15 cents a pound. Beto is not a cure for diabetes and to sell Epsom salt under the claim that it is a cure and with the deadly dangerous advice that when taking it, it is unnecessary for the diabetic to diet, is an offense against business morals and a menace to the public health. (*Jour. A. M. A., Jan. 24, 1925, p. 304.*)

SURGICAL ACCIDENTS IN SIMPLE INGUINAL HERNIOPLASTY*

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Because of modern surgical technic and asepsis, the surgical operation for the radical cure of uncomplicated simple inguinal hernia is frequently viewed lightly by the general surgeon. Indeed, the busy surgeon-in-chief, of almost any large charity hospital, regards this operation, from a technical standpoint, much as a certain wit regarded the Russian language. In discussing the intricacies of this unusual foreign tongue, he said, "The Russian is such an easy language—even the children speak it—over there." In like manner the surgeon disdainfully assigns the task of the operation for inguinal hernia to the house surgeon or surgical interne. And this, not ungrateful, but surgically hungry and eager-to-operate individual, who faithfully believes himself to have been born with a scalpel in his hand, not too grudgingly accepts it as though the procedure were but a toy on which he might cut his surgical wisdom tooth.

Fortunately the technic of the operation has become so conventional and standardized as to have proven itself one of the safest as well as one of the most successful of surgical methods. The patient himself does not fear it, and indeed has learned to ask for it whenever required. Yet simple as it may seem, the operation is not without danger, even though the mortality is exceedingly low. The accidental injury of nerves, large blood vessels, the spermatic cord, hernial sac contents and urinary bladder, has caused irreparable harm and wrecked not a few lives.

This point was again forcibly impressed on me recently by the announcement of a threatened litigation, in which a well-known and prominent surgeon was about to be sued because of a complete atrophy of the testicle following operation in a case of simple inguinal hernia. This it was, that influenced me, in bringing before you today, this rather elementary subject.

The literature abounds with numerous and varied discussions of the choice of methods of operation for the cure of inguinal hernia. Modifications of the old and developments of the new are of fre-

quent occurrence. Indications and contraindications are emphasized. Mistakes and accidents, however, are rarely if ever mentioned. Indeed, the scarcity of detailed information, in medical literature, on this particular phase would tend to indicate that not much attention had been given to this important aspect of inguinal hernioplasty. Surgical accidents are chiefly the results of ignorance, carelessness, errors of judgment or defective technic. Because of the inherent human frailty which prevents mentioning and discussing, not to speak of publishing, our failures, accidents and mistakes, I have been unable to collect or review any series of cases.

Injury of the Nerves.—Among the most frequent, but fortunately less serious, accidents of inguinal hernioplasty, is injury of the nerves. These include the ilio-hypogastric, ilio-inguinal, and the genito-crural, and are mainly of the sensory type. Their main trunks are sufficiently large to be plainly seen and recognized. The ilio-hypogastric, the largest of the three, lies between the transversalis and the internal oblique muscles, above the crest of the ilium. About 2.5 to 3 cm. in front of the anterior superior spine, it penetrates the internal oblique muscle, running downward, under the aponeurosis of the external oblique, and pierces the latter, at about 1 inch above the external abdominal ring. The ilio-inguinal nerve also lies beneath the external oblique aponeurosis, but just above Poupart's ligament, and follows the course of the ilio-hypogastric, except that it accompanies the spermatic cord or round ligament, and emerges at the external abdominal ring. The genital branch of the genito-crural nerve enters the inguinal canal at the internal abdominal ring, traversing the canal, in company with the spermatic cord or round ligament, and emerges with it from the external ring. According to Cushing,¹ the ilio-hypogastric nerve may be twice encountered in the operation: the superficial supply, by the skin incision; and its deeper trunk, as it lies upon the muscle-fibres of the internal oblique at a varying distance from the lower edge of the muscle, by the incision which divides this muscle. In the inguinal canal, the ilio-inguinal and the genital branch of the genito-crural nerves are usually found anastomosed in one trunk. A division of the ilio-hypogastric nerve, he believes, causes an area of cutaneous anesthesia, surrounding the lower angle of the incision, and extending from a level about 7 centimeters above

*Read before the annual meeting of the Minnesota State Medical Association, St. Cloud, Oct. 8, 1924.

the root of the penis, within 1 or 2 centimeters of that organ. A division, on the other hand, of the ilio-inguinal and genito-crural nerves is represented by the usual anesthetic sequel of complete loss of sensation of the entire scrotal contents, cord, hernial sac, and testicle, with the possible exception of the lower vascular supply (superficial perineal), and by a cutaneous area of anesthesia, which occupies the inner side of Scarpa's triangle, over the abductor tendon. Division of the ilio-inguinal nerve is unassociated with any surface anesthesia of the scrotum whatever. Furthermore, his observations have been that a division of the ilio-inguinal and genito-crural nerves causes the cremasteric reflex to be lost, temporarily at least, on the side of the division. Therefore, particular care should be taken to avoid cutting, tearing, pinching, or bruising of these nerves. Division results in a complete anesthesia of the supplied area, from a few months up to two and one-half years. Inclusion of the nerves in the suture produces a persistent and annoying neuralgia, which may even require a dissection of the scar and freeing of the nerve before relief is obtained. As a result of many animal experiments, Moschowitz² has found that a complete division of the ilio-hypogastric nerve will be followed by a temporary anesthesia of the hypogastric region, that the inclusion of the nerve in the suture is likely to be followed by neuralgic pain, and also that a division of this nerve is not followed by local paralysis of the internal oblique muscle, contrary to the experiments of Dowd.³ The latter believes the ilio-hypogastric nerve, in a small proportion of cases, which are likely to have recurrences, acts as a security against a relapse of the hernia, depending in a large measure on the vitality of the part to which this nerve goes. In order to escape injuring it, he believes that the first opening in the aponeurosis of the external oblique muscle be made by a knife-cut one and one-half inch above and external to the external ring, then a curved scissors is slipped through this opening, and the nerve and muscle are pushed well back before proceeding with the incision. Mackechnie⁴ believes pain to be the most frequent complaint following inguinal hernioplasty, and in his opinion is due to the envelopment of the ilio-inguinal nerve in the scar tissues. Burrows⁵ believes injury to the ilio-inguinal nerve may cause a persistently tender scar. In one case he found it necessary to excise such scar tissue. Authorities

all agree that a division of these nerves is followed by an area of anesthesia, while their inclusion in the suture is a definite cause of neuralgic pain in this region as well as a tender scar.

Injury of the Blood Vessels.—An accurate knowledge of the course of the blood vessels of the inguinal region is essential for the successful hernia operation. Thus we are mainly concerned with the deep epigastric and the external iliac vessels. The former arise from the iliac artery and vein, behind Poupart's ligament, and according to Marcy⁶ pass upward and inward close to the inner and under side of the cord, between it and the symphysis pubis. Here is given off a branch to the cord. For nearly two inches of its course the artery lies posterior to all the abdominal muscles beneath the peritoneum. It ascends obliquely and upward to the margin of the sheath of the rectus muscle. In its course, it lies behind the inguinal canal, to the inner side of the internal abdominal ring and immediately above the femoral ring. The position of the artery concerned in the hernia operation is, in the beginning of its course, close to the inner and under side of the spermatic cord where the latter issues from the internal ring. Here the artery is generally three inches from the symphysis pubis, and is at the same distance from the spine of the ilium. The artery is accompanied by veins, the largest of which is consistently found on the inner side of it. They end by a single trunk in the iliac vein. The external iliac artery is of far more importance in the surgical anatomy of inguinal hernia. This artery extends from the bifurcation of the common iliac, opposite the sacro-iliac articulation, to a point beneath Poupart's ligament between the anterior superior spine of the ilium and the symphysis pubis. It is accompanied throughout its course by the external iliac vein, which lies in a slightly posterior plane. Wounding of this artery is a catastrophe, and is usually brought about by an accidental needle puncture, when, in the suturing of the conjoined tendon to Poupart's ligament, the needle is passed too deeply. Coley⁷ says he knows from personal conversation of four instances of injury to these vessels from needle puncture. O'Connor⁸ refers to two instances in which the vein was wounded in like manner. Burrows⁵ has seen the artery so injured that ligation was found necessary and thinks it possible that some of the cases of thrombosis of the femoral vein following the operation for inguinal hernia are the

results of such misadventure with the needle. I, myself, have seen such a case, with later occlusion of the femoral artery, resulting in gangrene of the leg and death. For the avoidance of this accident, or at least to reduce it to its minimum, it is necessary that only a round, half-curved needle (never a cutting needle) be used; that the needle be firmly held in the grasp of the needle holder; that the suture material be not too thick or too coarse; that Poupart's ligament be well exposed; that the blood vessels be depressed and held out of the way of harm by a flat retractor; and finally that the needle and sutures be introduced from within, outward, and never too deeply. Should one be so unfortunate as to have injured this vessel, it becomes necessary to expose it, by either the intra- or extra-peritoneal route, and to suture the rent with a number 16 cambric needle, threaded with human hair or the finest silk, coated with vaseline. While the collateral circulation, carried on from above a ligature anastomosing with the vessels from below is good, the danger of gangrene is greater than when suturing is resorted to. The deep epigastric vessels are easily tied if wounded, unless the injury is inaccessible and located near the origin of the external iliac, when it becomes necessary to treat the condition in the same manner as an injury to the external iliac itself. Erdman⁹ reports such a case in which he found it necessary to suture the rent in the iliac vessel in order to control the hemorrhage from the wound in the epigastric vessel. Usually, however, the deep epigastric can be tied without fear of risk.

Injury of the Spermatic Cord.—Damage to the spermatic cord is not uncommon during operations for the cure of inguinal hernia. This injury may include the vas deferens, the spermatic artery, the veins of the pampiniform plexus, or some of the accompanying nerves. It is also well to remember that the spermatic artery is a branch of the aorta, and that the right spermatic vein empties into the inferior vena cava and the left into the renal vein. It is extremely important, for the sake of the ultimate welfare of the testicle, that these vessels be handled with the utmost care and gentleness, so as not to injure them. A division of the artery may result in a complete atrophy or necrosis of the testicle. If torn, the artery can scarcely be united and had best be ligated. The careless handling of the veins, tearing, pinching, or bruising them, may be followed by thrombosis, swelling of

the testicle, orchitis, atrophy, or hydrocele. The injuries are most likely to happen when separating the cord from its attachments to the sac. Careful, clean, sharp dissection with the knife is better than the use of the finger and gauze method. Judgment and care must also be exercised in avoiding constriction of the cord, especially at its exit from the external abdominal ring, as well as avoiding the catching of the vessels of the cord in the sutures of the conjoined tendon to Poupart's ligament. Seward Erdman,¹⁰ in his notes of 1,093 hernia operations on males, found that 144, or 13.1 per cent, had scrotal tumefactions; fifty-one, or 4.6 per cent, were early hydroceles, demonstrated by aspirations, and there were ninety-three cases of other tumefactions in the scrotum, classified as distention of the veins above the testes, thrombosed veins, thickening of the tunica after excision and turning back of the same, hematoma, epididymitis and orchitis, of which the last nine proved or showed atrophy of the testicle. In these cases, where the vessels have become injured in one manner or another, swelling or tumefaction of the testicle will make its appearance in twenty-four to forty-eight hours following the operation. The atrophy does not manifest itself, however, until four to six weeks later, by which time the patient has usually left the hospital. Thus many of these cases are lost sight of, and the record of the progress of the patient remains incomplete, unless he, furious at his loss, returns to question the much embarrassed surgeon. One such case I recall distinctly. The accidental division of the vas deferens, while unfortunate, probably does no greater harm than to produce sterility of the divided side. Rolnick¹¹ has recently performed some very interesting experiments on the vas deferens in dogs. His conclusions are that the vas will regenerate itself if divided or resected for as much as one-half inch of its length, provided the sheath is left partly intact or united. If severed, the divided vas can be easily sutured and in each instance this should be attempted.

Injury of the Hernial Sac Contents.—As almost every abdominal organ has been found in the hernial sac it behooves the surgeon to be cautious in opening or transfixing it lest the organ be injured. In every case the sac should be opened and the organ replaced within the abdomen. If the omentum is adherent to the sac wall, it must be carefully liberated and ligated before returning to the ab-

dominal cavity. In dissecting away adherent gut, care must be exercised not to injure it. In cases in which the adhesions of the gut are close and extend to the sac wall, it is better to excise and leave portions of the sac wall attached to the gut, and to replace it, than to perforate or accidentally tear it. Should the bowel be accidentally injured, it must be repaired at once. Lembert or purse string sutures should be used, reinforcing the first row by a running suture, with finally a piece of omentum tucked over the wound to prevent leakage and adhesions. Similarly any organ thus injured must be repaired immediately. In ligating the sac or transfixing it, one must be careful not to include any tissues but the sac. The caput colon, appendix, ovary, and other organs have thus been cut off and not recognized until subsequently. Murphy¹² insisted on never ligating tissues outside of the canal, except under the guidance of the eye.

Injury of the Urinary Bladder.—A large number of examples of bladder injury, during the operation of inguinal hernioplasty, is to be found in the literature. These are frequently the result of inclusion of the bladder in the ligature of the sac, especially in direct hernias, where the inner wall of the sac is often in contact with the bladder; of tears when dissecting out the sac, and of puncture or incised wounds where the thin bladder wall is easily mistaken for the sac. The escaping urine is frequently erroneously mistaken for serum from the peritoneal cavity. It is also well to recall in operating upon infants and children that the bladder is situated higher than in adults. According to Baker,¹³ the following conditions during the operation should make one suspicious of the nearness of the bladder: presence of an unusual amount of fat (extraperitoneal) in the inguinal canal; the large size of the hernia opening (out of proportion to the amount of herniated omentum or intestine); and that the hernia is more often of the direct type. Such fat as has been mentioned must always be liberated and never included in the ligature encircling the neck of the sac. Difficulty may be encountered in separating the hernial sac, and more especially posterior portion, from which the bladder is evolved. Free bleeding is likely to ensue. In suspicious cases, where urinary symptoms are present, methylene blue may be given for a few days prior to the operation. If during operation a suspicious tumor presents, the abdomen, according to Watson,¹⁴ should be opened from above, and the

tumor examined from the inside. A hypodermic syringe may also be used in these cases to aspirate, and the litmus paper test used. A sound may be passed, and the tip felt in the bladder, or the suspicious tumor may be distended by air or water injections. In operating in these cases, under local anesthesia, Watson¹⁴ has observed, if traction is made on the sac and causes the patient to express a desire to urinate, it is a sign that the bladder is near and usually adherent to the inner side of the sac wall. Should the bladder be accidentally injured, no serious harm is done if it be promptly recognized and as promptly repaired. If, however, the injury be not recognized for twelve to thirty-six hours, the prognosis becomes serious. In the presence of painful and frequent urination, vesical, tenesmus, bloody urine per urethra, or oozing through the dressings, bladder injury must be suspected to have taken place during the operation. In a majority of the cases, where the bladder is found in close proximity to the hernia, its walls become so thinned out as to become totally unrecognized as muscle. In some cases, where the bladder forms part of the sac wall of an ordinary hernia, it may be entirely overlooked, and considered merely as a thickened patch in the sac wall itself. In fifty-seven cases of bladder hernia reported by Curtis,¹⁵ twenty-three were recognized before injury; in four, it was not seen until injured; in two, it was not seen at all during the operation; in ten, it was mistaken for the hernial sac; in five, for a tumor or cyst; in three, for a thickened patch in the sac wall; in three, for properitoneal fat; in one, for degenerated omentum; and in one, for haustrum of the colon. Watson¹⁴ advises, in cases of injury to the bladder, that it be caught immediately with hemostats and clamps placed across the opening. Compresses should be placed so that the escaping urine, if any, will not contaminate the wound or reach the abdominal cavity. The bladder opening should be closed with interrupted chromic catgut sutures in two or three layers. No suture, however, should go through the mucous membrane, which in closing must be inverted. The bladder is then anchored in the lower part of the wound. The contaminated tissues are swabbed with tincture of iodine, in order to produce adhesions, and all dead spaces carefully closed. A drain may be inserted down to the bladder, and permitted to remain for two or three days. A retention catheter is usually unnecessary, besides

being the source of considerable discomfort. Catheterization every four hours is sufficient.

In conclusion, permit me to quote from "Hernia and Its Radical Cure" by J. Hutchinson: "The radical cure of hernia is one of the most successful of all operations, one of the most frequently performed, and one of the greatest importance to the community." Hutchinson also emphasizes the fact that the operation is not a minor one, and that its real success depends on a painstaking technic rather than on a rapid performance. Since surgical accidents are, in the main, the result of ignorance, carelessness, misjudgment, and defective technic, or a combination of them, it behooves us not to consider this operation too lightly, but rather to consider each case separately, and to apply the operation best suited for that individual case, to take more time and more pains in order that every source of accident be carefully avoided and the purpose of the operation be successfully attained.

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DISCUSSION

DR. GUSTAV SCHWYZER (Minneapolis): Dr. Robitshek's paper is handling a very appropriate subject, interesting not

only to the specialist in surgery, but also to the country practitioner. He must know of these dangers and accidents that will and have occurred in operations for inguinal rupture.

There really is no object in criticising Dr. Robitshek's paper. It does not call for criticism. I think it is of more value if we mention some of our cases emphasizing the very dangers referred to in the paper.

Looking over a period of thirty years or more, I was rather fortunate that I did not find any death records in my inguinal herniotomies, though I witnessed some deaths following operations done elsewhere. For instance, one distinguished surgeon operated for inguinal herniotomy, causing a thrombosis of the iliac vein. Death occurred within twenty-four hours due to embolism of the pulmonary artery. Evidently the iliac vein was pierced when placing the deep sutures.

Recently I had a case where the left ureter was dissected for a distance of about 2.5 cm. It was in a man of thirty-five years who had a high inguinal rupture. Anterior to the neck of the hernial sack we found a band-like structure about 2 mm. wide, rather flat. We excluded blood vessel and nerve tissue and took the same for the left ureter. It went in a direction toward the bladder on the inner side and could be followed on the outer side intra-abdominally. We had no trouble in finishing our operation by constantly guarding the ureter.

Good luck was with us in another case, in a man of thirty-four years on whom we amputated a well pedunculated diverticulum of the bladder while operating for inguinal hernia. The diverticulum appeared like a club-shaped piece of superfluous fat, but when cut through we noticed a lumen, the inside of which showed a smooth surface not like the mucous lining of the bladder. There was no fluid. The suture apparently tying off this diverticulum did not hold very well. For that reason we put a second suture solidly over the first one. No drainage was used. The healing was prompt and ideal. Blood in the urine following operation confirmed the diagnosis. We catheterized very frequently for two to three days and used a weak solution of silver nitrate.

A year ago I operated for a very large strangulated inguinal rupture in an elderly man. The content of the hernia was a great amount of filled small intestine. There was a very large inner ring and no canal as we find it in such cases. With the finger inserted in the ring, I was able to go clear around between the ring and its content. Still I was unable to replace the scrotal content into the abdominal cavity. I opened the abdomen and pulled on the strangulated loop from within and pushed with the other hand from without. In this way we could replace the strangulated scrotal content, which did not require any resection. The patient recovered, though he had a nasty scrotal infection.

It is well known to us that in strangulated hernia the bacteriological examination of the fluid in the tunica propria vaginalis is always positive for coli bacilli. For that reason we always use drainage of some kind. We never drain a simple herniotomy. In spite of this drainage the wound healing can be surprisingly prompt. This, for instance, we observed in a thirty-year-old man who presented a very large strangulated rupture with a great amount of gangrenous-

small intestine. We resected one yard of small intestine, making an end-to-end anastomosis with the Murphy button. The patient left the hospital with his hernial wound well closed in two weeks.

DR. A. R. COLVIN (St. Paul): One has to hunt around very industriously for something to say in a paper that has been so thoroughly discussed. When Dr. Robitshek spoke of hernia operations being relegated to interns and the mistakes and accidents that might happen, it occurred to me that all the accidents that I have seen have been at the hands of experienced surgeons.

An eminent surgeon once said that there is no such thing as minor surgery. I am accustomed to say to interns and students with surgical aspirations, that most surgeons who are quite frank will say that they have had many of the accidents that they have been critical about others having had, and those they have not had, they are afraid they will have if they do enough surgery. It is perhaps the forgetting of this that even experienced men have to acknowledge the accidents of inguinal operations.

The last mistake I saw, in passing, was the opening of a sliding hernia of the cecum. Perhaps it is well to remember the happenings that are still beyond our control.

I shall never forget one poor fellow who came to me with both knees and ankles stiffened and still painful after four years with destructive non-suppurating arthritis, following phlebitis which was consequent on an operation for hernia.

DR. ARTHUR N. COLLINS (Duluth): A discussion on the merits of hernia operations, speaking to a title such as this, is incomplete without mentioning the very, very grave accident of infection. If there is any one operation that I hate to get an infection in, it is a hernia operation. It disturbs the whole complex. I don't know of any operation in the region of the abdomen where an infection is so poorly taken care of as in a hernia operation. I don't know of any place where infections in the abdominal wall carry with them the necessity for going back and doing the operation all over again. I think that the surgeon is perhaps a little too careless about puncturing the gloves. Every puncture of the gloves in a hernia operation should mean removing that glove and putting on a fresh one. This will contribute to less infections and more primary unions.

DR. G. G. EITEL (Minneapolis): Dr. Robitshek reminds us of the all-important points in which every one who is, or contemplates, doing the operation for the radical cure of inguinal hernia must have clearly in mind and should be able to fully carry out if the best interest of the patient is to be served. The operator must not merely have a good theoretical anatomical knowledge of this subject, but he must be able to recognize all tissue structures as he meets them. There must be no guesswork, and unless the operator has this knowledge he is not able to do that which should be expected of him as a surgeon.

There is no question but that many lives have been lost by bungling, incompetent, would-be surgeons, to say nothing of the many bad results which are the outcome of the lack of knowledge and skill.

The subject has been so thoroughly dealt with by the essayist as well as by my fellow discussers of the paper that I shall not presume to trespass further upon your time. I thank you.

THE PROGRESS OF CARDIOLOGY DURING 1924: A REVIEW OF THE WORKS OF CLINICIANS AND INVESTIGATORS IN THE UNITED STATES

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In this age of scientific progress, in which the cogs of clinical and laboratory investigations grind ceaselessly, it seems appropriate to record the achievements in diseases of the heart and circulation during the year just passed. Such a record should not satisfy us, but should stimulate more effort in the search for more accurate methods with which to solve the many unanswered problems relating to this important branch of medicine. The full importance of investigation along this line is realized when one recalls the fact that heart disease causes the largest number of deaths annually in the United States (about 155,000), that it also results in more or less continuous disability of 2,500,000 people, and is the greatest single factor in causing disability, dependence and death.

I. PREVENTION OF HEART DISEASE

Since the organization of the associations for the prevention and relief of heart disease in New York, Boston, Philadelphia, and Chicago, a national body, the American Heart Association, has been formed. This organization will be a vital factor in the campaign against heart disease by bringing clearly before the public the ways and means of prevention which, to educate the masses, must be fundamentally approached in terms of hygiene. In this connection, I wish to call attention to "Hygeia," published by the American Medical Association, which has made possible the most important advances of recent years in the education of the public in medical matters. The beneficial influence of this publication will be limitless.

Faulkner and White investigated rheumatic fever, chorea, and rheumatic heart disease, with especial reference to their occurrence in families. They studied the families of 200 ward and outpatients with rheumatic infections, comprising a group of 1,235. Their criteria with regard to previous rheumatic infection were: (1) the history of a definite attack of rheumatic fever with multiple involvement of joints, (2) definite choreiform movements, or (3) definite evidence of mitral ste-

nosis. Their study revealed that in seventy-one families (35.5 per cent), more than one member was affected with a rheumatic infection, or 8.79 per cent of 1,235 persons exposed were affected. For comparison they studied the families of seventy-five persons with no evidence of past or present rheumatic infection, but who were otherwise comparable. Positive evidence of rheumatic infection was found in 16 per cent of the families, and in 2.95 per cent of the individuals.

Denzer comments on the extreme rarity of rheumatic carditis in infancy and quotes Still, who did not observe it in children less than two years of age in a study of 1,027 children with articular and cardiac rheumatism. Denzer reports three cases, the patients being twenty, twenty-three, and twenty-four months old, respectively. In the two cases that came to necropsy, the characteristic Aschoff bodies were demonstrated in the myocardium, while in the other case the objective cardiac findings and the presence of subcutaneous fibrous nodules substantiated the diagnosis of rheumatic carditis.

McCulloch believes that children suffer from chronic heart disease due to changes in the heart muscle. These changes, in turn, are due to the action of a poison liberated by a focus of infection, usually in the nose, accessory sinuses, or tonsils. Many of these children have no further heart trouble, and may be restored to normal health. Usually they do not have characteristic rheumatic fever with objective signs in the joints, although they may have joint or muscle pains. McCulloch does not believe that these children ever have rheumatic fever.

In discussing the etiology of cardiovascular disease, Barnes emphasizes the importance of constitutional heritage in relation to children whose parents have "rheumatism" and cardiovascular diseases. He calls attention to the importance of infectious and bacterial diseases in children, with especial reference to their complete recovery after the removal of all foci of infection. He also calls attention to the causes of capillary spasms and hypertension, with special reference to defects in infants and older children, endocrine and reflex disturbances, autointoxication, and intestinal intoxication. He emphasizes the desirability of educating the laity with regard to the causes of cardiovascular diseases, of the importance of keeping well, and of the need of proper relaxation, recreation, work and exercise.

Woody's observations on the incidence of heart disease among negroes is interesting, as the incidence is on the increase. This is explained by the increase in acute infectious diseases, focal infections, and venereal diseases.

Miller believes that a definite relationship exists between sinus empyema and cardiac diseases, and especially between chronic valvular disease and subacute bacterial endocarditis.

II. ENDOCARDIUM

From a painstaking study of 220 cases of endocarditis, Clawson draws the following conclusions: Death from cardiac failure when the patient is less than forty years is practically always the result of a valvular injury. Endocarditis, which is at once associated with acute rheumatism, is rarely the cause of immediate death, and when death occurs it is usually the result of pericarditis or heart failure. Embolic processes are common in all forms of bacterial endocarditis, but most common in the subacute form. Embolic glomerulonephritis is rare except in the subacute bacterial type. Enlargement of the spleen with cardiac disease generally indicates an active inflammatory process in the valves, rather than a congestive phenomenon. Active involvement of the endocardium of the auricles and ventricles rarely occurs except in the subacute bacterial form. Pericarditis generally accompanies the rheumatic type of endocarditis. The acute bacterial form is chiefly the result of the invasion of the *Streptococcus hemolyticus* and the staphylococcus, while the subacute form results invariably from the *Streptococcus viridans*. Death in such cases usually results from cardiac failure.

Libman and Sacks describe a new form of valvular and mural endocarditis which deserves emphasis. The morphology and localization of the lesions differ from those in subacute bacterial, rheumatic, and other forms of endocarditis. In their cases all four valves were involved and there was a tendency toward involvement of the mural endocardium. The lesions invariably extended from the ventral aspect of the posterior cusp of the mitral valve along the adjacent mural endocardium of the posterior wall of the ventricle, and there were isolated areas of mural endocarditis in the right auricle and both ventricles. The vegetations were free from demonstrable organisms. The myocardium failed to show Aschoff or Bracht-Waechter bodies, and no glomerulonephritis occurred. This

form of endocarditis seems to attack young persons with previously normal valves, and runs a subacute course attended by fever and a secondary type of anemia.

In a series of sixty-eight cases of sepsis treated by repeated transfusion, Stetson reported eight cases of *Streptococcus viridans* endocarditis. Only one of the patients recovered.

In two cases of mycotic aneurysm, Reifenstein was able to determine the etiology quite accurately. One case, due to the gonococcus, was insidious in onset, protracted in duration, and presented all the classical signs and symptoms of septicemia; the other, due to the pneumococcus, ran an acute course and gave out relatively few localizing signs.

Talley and Lindsey, in a study of splenic enlargement associated with chronic cardiac disease, have observed that an appreciable splenomegaly is not a common clinical finding in the pure stasis of chronic cardiac failure by congestion. A distinct splenomegaly in chronic cardiac disease suggests recurrent endocarditis. Perisplenitis in chronic cardiac disease is commonly preceded by infarction, but the latter is infrequent with this condition. The presence of symptoms indicative of perisplenitis suggests either a recurrent infection or a well-defined mitral stenosis.

Kahn emphasizes the importance of distinguishing between the thrill of mitral stenosis and adventitious thrills of other abnormal conditions. In neurocirculatory asthenia the apparent thrill is due to diffusion of the apex beat as it strikes several rib spaces with a forcible and jerky movement. On palpation this systolic shock gives the impression of a presystolic thrill. If the stethoscope is placed obliquely on the chest wall so that its edge lies within an intercostal space and its mouth inclines toward either the upper or the lower rib, the rumble disappears.

In discussing true and false presystolic murmurs, Reid emphasizes the fact that there are two murmurs, one rather rare, which is produced by contraction of the auricle, and the other, more common, due to the first part of ventricular systole. The latter murmur is the result of regurgitation of blood into the auricle. Confusion of the true and the false presystolic murmurs leads to diagnostic errors.

III. MYOCARDIUM

Peshkin believes that the primary myocardial insufficiency syndrome of asthma is an important

etiologic factor in certain types of asthma in persons past middle life. A regular and persistently increased pulse rate, with a history of subjective symptoms indicating the earliest stages of myocardial failure and the onset occurring after forty years of age, is diagnostic of primary myocardial insufficiency asthma, when other causes of asthma can be excluded.

In a detailed study of 102 hearts in cases of noninfectious myocardial failure, Clawson has recorded various findings. The cases represented hypertension, chronic glomerulonephritis, right ventricular hypertrophy, defective valvular disease, syphilitic aortitis, and adherent pericarditis. The only anatomic changes were coronary sclerosis and myocardial fibrosis. Sclerosis of the coronary arteries was marked in 22.5 per cent of the cases, and myocardial fibrosis was marked or moderate in 20.5 per cent, and slight in 30 per cent. Myocardial fibrosis is usually the result of coronary disease, but occasionally slight degrees are noted in rheumatic infections. Myocardial strain (hypertensive or nonhypertensive) is not a cause of myocardial fibrosis. Syphilitic myocarditis is rare. Myocardial failure is rarely due to anatomic changes in the myocardium, but to exhaustion of the heart muscle.

Warthin investigated the hearts in sixteen cases of diphtheria that came to necropsy. The most constant lesion was a toxic parenchymatous hyaline degeneration or necrosis in many cases associated with fatty degenerative infiltration, and in some with cloudy swelling or simple necrosis. Complete regeneration or fibrosis may result in such cases. The toxin of diphtheria may affect conduction as well as the contractile mechanism, although no special affinity is shown for either.

The analysis of the cardiac findings in a group of patients with arthritis deformans by Boas and Rifkin revealed the fact that about 45 per cent had organic heart disease. Endocardial valvular disease occurred in 17.5 per cent of the patients, and of these, 28 per cent were less than forty years at the onset of the arthritis. Heart disease with arteriosclerosis of the valves or hypertension occurred in 26 per cent, and of these 4 per cent were less than forty years when the disease began. Of the patients more than forty years at the beginning of their illness, none had endocarditic lesions, while 63 per cent had arteriosclerotic heart disease.

In a clinical study of thirty-seven cases of com-

plete heart-block (Willius) it was found that the apparent etiologic factor in 62 per cent was arteriosclerosis, in 19 per cent rheumatic heart disease, in 15 per cent diphtheria, in 3 per cent influenza, and in 3 per cent the probable cause was not determined. Fifty-four per cent of the patients had Adams-Stokes attacks, 16 per cent presented symptoms of the congestive type of heart failure, 16 per cent complained only of dyspnea on exertion, 8 per cent had angina pectoris, 3 per cent had angina pectoris and Adams-Stokes seizures, and 3 per cent had no complaints referable to the cardiovascular system. Of twenty-two patients traced, 68 per cent died from heart disease an average of seven months after examination, and 23 per cent died during the Adams-Stokes attacks. Of the patients with Adams-Stokes attacks 73 per cent died from heart disease.

A case of so-called idiopathic cardiac hypertrophy in an infant of twelve months is reported by Carrington and Krumbhaar. A mild nephritis, myocardial fibrosis, and an anomalous coronary artery arising from the pulmonary artery are considered possible causes.

Boas and Dooneief, in discussing the mechanism of peripheral stasis in myocardial insufficiency, conclude that the chief cause for peripheral stasis and edema lies in the weakened cardiac contraction, and not in the back-pressure effects.

Levine and Sturgis observed five patients who presented a picture of heart disease who had been treated for heart trouble for a year or two previously. The advent of transient auricular fibrillation first directed attention to hyperthyroidism as the underlying cause of the symptoms. H. S. Plummer, of the Mayo Clinic, called attention to this diagnostic pitfall about ten years ago, with special reference to adenomatous goiter with mild hyperthyroidism. In this connection a paper by Eyster directed suspicion to early hyperthyroidism in patients presenting themselves for examination because of cardiovascular symptoms. Dameshek records a detailed study of the heart in hyperthyroidism, which is interesting and worthy of mention.

Bohan discusses the relation of tonus to cardiac dilatation and to the other properties of heart muscle. Hypertension and coronary disease appear to be common causes of dilatation. The symptoms vary according to the degree of dilatation.

The study of ball thrombi of the heart by Abram-

son is interesting and includes a full description of the literature on this rare condition. He accepts the criteria for ball thrombi as expounded by Welch, that is, entire absence of attachment and imprisonment, due to its size, and such consistency and shape as to prevent its lodgment as an embolism in the circulatory passage ahead of it. Including the case reported, only twenty cases were found in the literature. While thrombosis of the left auricle does not give rise to a typical syndrome, the following findings are very suggestive: mitral stenosis associated with marked disturbance of the general circulation, extremely feeble pulse, and gangrene or cadaveric coldness of the lower extremities. At the present time there is no way of distinguishing between a ball thrombus and other types of thrombi of the left heart.

IV. THE CORONARY ARTERIES, AND ANGINA PECTORIS

In determining the variations in the anastomosis of the coronary arteries and their sequences, Oberhelman and LeCount studied twenty-six human hearts, chiefly from males who died between the ages of fifteen and seventy years. The hearts were cooled for from twelve to twenty-four hours to allow rigor mortis to disappear, then the coronaries were injected with metallic mercury under a pressure of from 125 to 150 mm. Fluoroscopic and microscopic examinations were made. A precapillary anastomosis between the branches of the two coronary arteries was demonstrated by the escape of metallic mercury from the mouth of one of them in from one to three minutes after its introduction into the other. The authors believe that at least two highly important factors are involved in disease of the coronary arteries and their ramifications, each subject to so much variation as to be comparable to the "variants" of mathematics. One is the normal difference in the arterial bed of the myocardium with regard to the anastomosis between the branches of the two coronary arteries. The other is the rate at which narrowing or occlusion of the branches of either or both arteries occurs, for with gradual occlusion, an enormous compensatory anastomosis may develop.

Drury and Smith, in their studies on the nerve supply of the coronary arteries of the tortoise, found that the arteries could be constricted by direct application of adrenalin in dilutions of 1:10,000 or even 1:100,000. The smaller branches were more susceptible than the larger ones. Stimulation of either vagus opened the arteries to their

full extent, and general or local atropinization abolished the vagal reaction.

A correlation of clinical and necropsy data was made by Willius and Brown in eighty-six cases of coronary sclerosis grouped thus: (1) typical angina pectoris, 24 per cent; (2) atypical angina pectoris, 2 per cent; (3) progressive myocardial failure, 26 per cent; (4) angina pectoris and progressive myocardial failure, 8 per cent; and (5) occult coronary sclerosis, 40 per cent. In the last group, the diagnosis of coronary sclerosis was not made by the internist, and a careful review of the records of these patients revealed insufficient subjective or objective evidence of heart disease to establish the diagnosis with the usual clinical methods of examination. The thoracic aorta was diseased in 99 per cent of the eighty-six cases; there were sclerosis, atheroma and ulceration in 90 per cent, and syphilis in 9 per cent. The abdominal aorta was sclerotic, atheromatous and ulcerated in 21 per cent of the cases, and in one case there was a nonsyphilitic aneurysm. The cardiac valves were involved by sclerosis, fibrosis, or atheroma in 50 per cent of the cases, and in one case there was an acute vegetative tricuspid endocarditis. The aortic valves were most commonly affected and the mitral and tricuspid valves in the order mentioned. There was evidence of myocardial degeneration in all cases. Disease of the pericardium was found in 9 per cent of the cases, and consisted of chronic adherent pericarditis in four cases, chronic fibrinous pericarditis in two, terminal fibrinous pericarditis in one case, and obliterating tuberculous pericarditis in one. Arteriosclerosis of the peripheral vessels was evident in 70 per cent of the cases, and arteriosclerosis of the kidneys in 37 per cent. Cerebral arteriosclerosis was found in thirteen of the fifteen brains examined. Nephritis was present in varying degrees in 53 per cent of the cases. Hypertension occurred in 31 per cent of the eighty-six cases. The average systolic blood pressure was 183, the average diastolic pressure 111, and the average pulse pressure, 72. The height and weight of forty-nine patients were available; 27 per cent were distinctly obese.

Sudden death occurred in 37 per cent of the cases in the series. The highest incidence occurred in patients with typical angina pectoris, 38 per cent of the patients dying suddenly. In order of frequency, the other clinical types of coronary sclerosis attended by sudden death were: occult

coronary sclerosis, 21 per cent; angina pectoris with progressive myocardial failure, 19 per cent; progressive myocardial failure, 17 per cent, and atypical angina pectoris, 6 per cent. Death was the result of gradual cardiac failure in 15 per cent of the cases. Causes other than heart disease were responsible for death in 48 per cent of the cases. Of the patients examined electrocardiographically, 68 per cent manifested significant graphic abnormalities.

Gordinier reports thirteen cases of coronary arterial occlusion and calls attention to the definite syndrome which occurs. There is sudden, severe anginoid pain, substernal or located in the upper abdomen, a pinched, ashen-gray or very pale facies, often associated with the sensation of impending death. There is frequently an acute emphysematous distention of the lungs, with dyspnea or extreme orthopnea and moist crackling râles at the bases of the lungs, together with the evidences of the acute onset of cardiac decompensation. An easily compressed thready pulse, presenting any type of arrhythmia, and a sudden drop in the systolic pressure often occur. The cardiac impulse, if detectable, is a diffuse feeble tap with distant heart sounds, and often a tic-tac or gallop rhythm. A localized pericardial friction rub, which is evanescent, appears as early as a few hours or a day or two after the onset of the attack although it may be inaudible if the infarct is on the posterior aspect of the heart. A fever of short duration associated with a polymorphonuclear leukocytosis invariably occurs. Inversion or iso-electric T waves and arborization block, are often disclosed by electrocardiographic study.

The foregoing symptoms and signs, in the presence of a large, tender liver and evidence of pulmonary infarction are suggestive of thrombosis of the right coronary artery or its branches, whereas the sudden onset of pulmonary edema or recurring attacks, together with sudden arterial plugging of the cerebral vessels, viscera or extremities, is suggestive of thrombosis of a branch of the left coronary artery.

In a purely theoretic manner, based somewhat on the ideas of Albutt, Reid attempts to explain the mechanism of angina pectoris. He claims that a failure of the reflex dilatation of the peripheral blood vessels leads to a sudden rise in pressure in the first portion of the aorta and the cavity of the left ventricle. This increased pressure in turn irri-

tates the local nerve and plates which respond by pain referred to the arm, shoulder, and so forth. This explanation is interesting, but fanciful in the light of the present knowledge of angina pectoris.

V. PERICARDIUM

The observations by Gauchat and Katz on pulsus paradoxus with special reference to pericardial effusions are based on clinical and experimental data. They call attention to the fact that pulsus paradoxus occurs with abnormal conditions of the respiratory system, such as partial tracheal or bronchial stenosis, bronchiolar spasm, laryngeal croup, pneumonia, and chronic emphysema. It also occurs with pathologic affections of the pericardium, such as mediastinopericarditis with thoracic adhesions, with pericardial effusion, and disappears after paracentesis. It is caused primarily by changes in the intrapleural pressure. Pulsus paradoxus associated with pericardial effusion is frequently observed when patients do not complain of respiratory discomfort. The authors claim that the condition, when unaccompanied by exaggerated respiratory effort, is a diagnostic sign of pericarditis with effusion. In their experimental studies, the authors found that traction exerted anywhere on the pericardial structures may produce pulsus paradoxus, the degree of change in the pulse depending on the tension. They were also able to produce the condition by first producing pericardial effusion.

The experimental work of Reid on the constriction of blood vessels has a definitely practical application to adherent pericarditis. Reid found that a constricting metallic band on the common

pulmonary artery of dogs does not affect the integrity of the wall of the vena cava, but leads to rapid necrosis of the wall of the aorta, and, as shown by one case, to much slower disintegration of the pulmonary artery. In this case, constriction by an aluminum band for a period of two and a half years led to hypertrophy of the right ventricle. Partial or complete occlusion of any large artery by a metallic band or a ligature invariably resulted in local necrosis of the vessel wall. Reid attempted to devise a method for producing partial or complete occlusion which would not result in necrosis. He was able to produce partial occlusion of the aorta of dogs, by Halsted mattress sutures of silk, and this occlusion persisted. He also completely occluded the aorta by anchoring fascial plugs in the lumen with silk sutures tied very loosely, but the vessel wall below and at the side of an occluding plug underwent marked atrophy.

Oppenheimer has advocated the production of artificial pneumopericardium following pericardial paracentesis. He cited one case, and said that the injection of air following drainage gave greater relief than aspiration alone and that the presence of air delayed the reformation of exudate.

An interesting case is reported by Youmans and Merrill, in which roentgenographic studies during life permitted them to identify calcification of the pericardium. They believe that these cases are essentially examples of advanced stages of polyserositis, tuberculous in origin. They say that rheumatism may produce a similar condition.

(To be continued)

Yadil.—This is an international fake of British origin. The advertising campaign for Yadil reminds one of Sanatogen in those palmy days when the public could be persuaded to pay a dollar for a few cents worth of cottage cheese. As Sanatogen was the apotheosis of cottage cheese, so Yadil is supposed to be a glorified and esoteric form of garlic. A part of the Yadil advertising campaign is an alleged history of garlic as a curative agent. Just what the theory of its use may be is not clear. Possibly the basic idea is that no self-respecting germ will want to tarry in an organism saturated with garlic. Yadil is put on the market by Clement and Johnson Bros., of London. The concern has a subsidiary company for its publicity, known as the Yadil Press, Limited (formerly called "Quality Press, Limited"). The American agents are E. Fougere and Co., New York. In the British Isles, newspapers and magazines are carrying full page and middle page spreads for Yadil for tuberculosis, for cancer, for scarlet fever, for gonorrhea, and for what-have-you. The British newspaper, *The Daily*

Mail, which has refused Yadil advertising, published in its issue of July 22, an exposure of Yadil, written by Sir William J. Pope, senior professor of chemistry in the University of Cambridge. Whereas the manufacturers claim that Yadil is "Trimethanal Allylic Carbide," and declare that it is of entirely harmless vegetable origin, its active principle being natural essential oil of garlic. Professor Pope, after an analysis of Yadil, stated that (1) it is not "Trimethanal Allylic Carbide," (2) that it consists of about 1 per cent formaldehyde, 4 per cent of glycerin, 95 per cent of water and a smell. According to Professor Pope the smell can be closely imitated by adding to one hundred tons of water, one ounce of oil of garlic. He also discusses the testimonials both from physicians and from laymen and shows the utter worthlessness of the testimony. In another article in *The Daily Mail*, Professor W. E. Dixon, of the University of Cambridge, emphasizes that the basic drug in Yadil is an irritant poison with cumulative effects, and characterizes some of the medical evidence for Yadil as nonsense. (*Jour. A. M. A.*, Aug. 16, 1924, p. 550.)

THE PRE-OPERATIVE TREATMENT OF HYPERTROPHY OF THE PROSTATE*

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The average mortality following prostatectomy, when pre-operative and post-operative treatment are under the direction of an urologist, is about 3 per cent. The mortality in some hospitals where general surgeons and general practitioners operate on prostatic patients is as high as 20 per cent. This difference is not due to the better surgical skill of the urologist, but to the careful pre-operative care that he has learned to give his patients before operation is considered.

The present method of treating prostatics as practiced by urologists is standardized and brings about such good functional results and occasions such a small mortality that little improvement can be expected in this branch of surgery until patients are operated on earlier. The urologist's present problem is the education of the general practitioner and the prostate patient so that relief will be sought when the first symptoms are noticed and will not be delayed until residual urine accumulates and renal damage occurs.

GENERAL PHYSICAL SURVEY

Pre-operative treatment consists first of a general physical survey. This examination may be made by the urologist, supplemented by special advice where indicated. My routine is to have this study made by an internist who considers and is interested in the patient as a whole and will find diseased organs and pathological conditions, whether in the urologic tract or not. Particular attention is given to the examination of the heart and the kidneys.

UROLOGIC EXAMINATION

Following the general physical survey, the urologic examination is made. This should include a complete roentgenogram of both kidneys, ureters and bladder, together with cystoscopy and ureteral catheterization. About 4 or 5 per cent of prostatics have renal stones and 12 per cent have bladder stones. These complications should be

known by the surgeon, as they may change the pre-operative plan of treatment. A clear roentgenogram, in the majority of cases, will demonstrate urinary stones if present.

Cystoscopy may not be done when the patient has a large amount of residual urine or when it is thought that this manipulation may introduce additional infection or precipitate an attack of uremia. However, at some time during every pre-operative treatment, cystoscopy can be safely done. With the cystoscope, one can determine when minor procedures may be done through the urethra which, if indicated, effect a more complete cure than prostatectomy. The pre-operative treatment plan may be changed or operation may be contra-indicated if papilloma, carcinoma, diverticulum, tabetic bladder or other bladder lesions are encountered. Such data are of great importance and can only be ascertained with the cystoscope.

The physician is not always able to make a diagnosis of hypertrophy of the prostate by rectal palpation alone. The median and bilateral lobes may enlarge into the bladder and urethra, so that they produce urinary difficulty and residual urine without a palpable enlargement per rectum. When such conditions exist, the diagnosis can only be made with the cystoscope.

RENAL FUNCTION

The most important consideration in pre-operative treatment is kidney function. When considering renal function in relation to prostatic hypertrophy, I mean renal damage produced by back pressure from residual urine with or without infection. A majority of my patients have some demonstrable renal damage which needs treatment before operation can be advised. Between 12 and 20 per cent of all patients seeking relief from prostatic symptoms will not be considered safe operative risks because of poor renal function or some secondary physical defect, which cannot be improved during treatment. Many operative deaths are attributed to other causes when poor kidney function was not ascertained before operation. In my experience, the amount of kidney damage is directly proportionate to the length of the history and the amount of residual urine, although renal damage may be found associated with as little as 200 c.c. of residual urine.

Before pre-operative treatment is started, the surgeon must have a fair estimate of the renal function. Patients who have very poor renal function

*Presented at the annual meeting of the Minnesota State Medical Association, St. Cloud, Minn., October, 1924.

indicate this fact so that when they are first seen the diagnosis is easily made. These old men look sick, their color is bad, the tongue is thick and dry, they have no appetite, have lost weight and may have an urinous odor about them which most often arises from the expired air. They are mentally slow and breathe rapidly. When symptoms of renal damage are not so evident, I rely upon blood chemistry. An estimate of the amount of creatinin and urea present in 100 c.c. of blood has proved, in my experience, the best index of the functional capacity of the kidneys at the time the test is made. The phenolsulphophthalein test of Rowntree and Geraghty is very useful, but cannot be used at all times unless the bladder drainage is continuous or complete. None of these tests indicate what the kidneys can do, but merely what they are doing at the time. A careful study of repeated functional tests before, during and following pre-operative treatment, together with the general condition of the patient after this treatment is completed, will indicate the true renal capacity. A patient who has submitted to pre-operative treatment and whose functional tests indicate a normal function, has a renal reserve which will carry him through the ordinary manipulations incident to the preparation and the operation for removal of the prostate.

THE HEART

The heart muscle must be carefully watched. Heart lesions are second in importance, as a result of hypertrophy of the prostate with residual urine. Swelling of the ankles may be noticed during the pre-operative treatment or when the patient first gets out of bed after gradual decompression. Such a patient should get around slowly and should receive digitalis until the heart muscle can carry on. When in doubt concerning the heart function, an internist is consulted. In some instances, the electrocardiograph is necessary before a correct diagnosis is possible.

BLOOD PRESSURE

The blood pressure must be taken frequently. A recent study by O'Connor¹ indicates that blood pressure is materially affected by renal decompression and prostatectomy. This author reports high blood pressure occurring in many patients which became normal before leaving the hospital following prostatectomy. Patients who have a permanently high blood pressure for their age should not be operated on. This is equally true of patients

with a low blood pressure: 110 systolic and 60 diastolic is the low level set by B. A. Thomas.²

BLADDER DRAINAGE AND RENAL DECOMPRESSION

Relief from residual urine and improvement in renal function go hand in hand and are accomplished by gradual drainage of the bladder. This is known as renal decompression and is accomplished in three ways: (1) by fractional catheter-

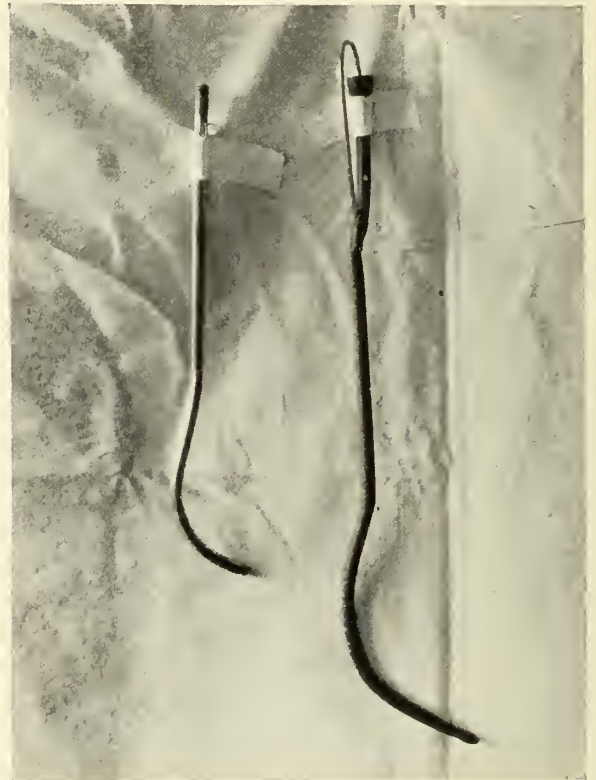


Fig. 1. Double curved prostatic catheter. Steel catheter guide introduced into soft rubber catheter.

ization, which may be repeated three or more times daily; (2) by a permanent urethral catheter; (3) by supra-pubic drainage, either fractional or total.

Frequent catheterization with drainage of part of the residual urine is troublesome and many patients object to it. If too much urine is withdrawn at one time, this may quickly reduce the pressure on the kidneys, which should be avoided. With this method, one cannot quickly control the pressure of residual urine if complications arise.

A permanent urethral catheter is the method of choice for bladder drainage and kidney decompression. I use a soft rubber catheter of 18-20 F size and always cut an extra hole about one-half inch proximal to the usual one. When in the urethra,

the catheter is held in place with adhesive plaster or tape. A piece of adhesive 7 inches long and 2.5 inches wide is torn or cut in two places for a distance of 4 inches, which makes a three-tailed piece of tape. The end that is not torn is made to adhere to the skin just above the root of the penis. The middle tail is carried downward over the superior surface of the penis and onto the catheter. The side tails are carried around the penis and then around the catheter. A piece of adhesive, 4 inches long and 2 inches wide, is torn in like manner and applied to the skin of the under surface of the penis. This arrangement will anchor a catheter in the urethra so that it comes out with difficulty. The skin where adhesive tape is sup-

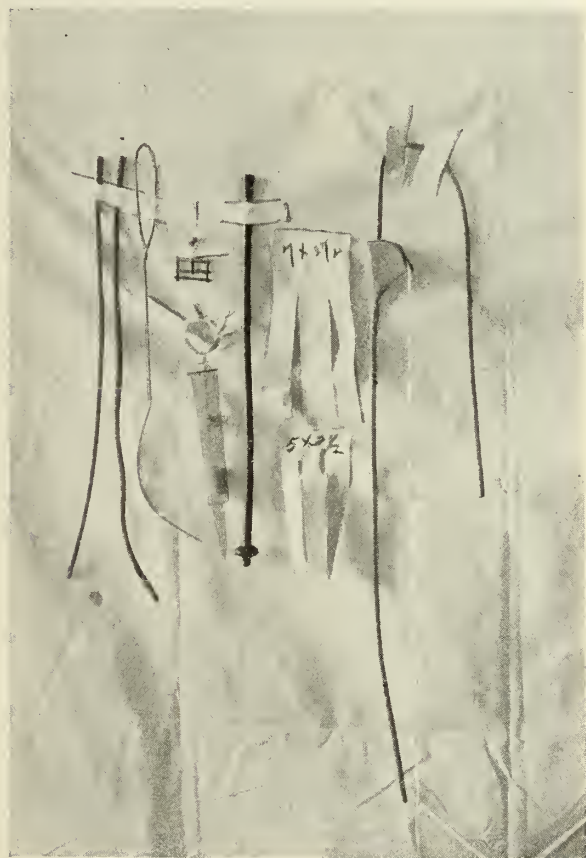


Fig. 2. From left to right: Ordinary rubber catheter with one eye, rubber catheter with extra eye—about one inch from end, mandarin or catheter guide, snap which acts as a sphincter, half ounce syringe used for irrigation, mushroom-end catheter for suprapubic drainage, adhesive strips used for anchoring catheter in urethra, Pilcher bag.

posed to adhere should be carefully washed with a sponge containing a small amount of benzine. Before the adhesive strips are permanently adjusted, the catheter should be irrigated so that one is

sure it is going to drain. The solution which is injected should return at once if the catheter is in its proper place. If it does not drain, it must be introduced farther into the bladder or pulled out a short distance. It is sometimes very difficult to place a catheter so that it will drain constantly. If bleeding occurs, clots may interfere with the drainage and necessitate frequent irrigation. When the bladder is not to be drained entirely and gradual decompression is to be practised, a small snap or clamp may be put on the catheter so that at regular intervals a small amount of urine may be withdrawn.

The passage of a soft rubber catheter when the prostate is enlarged is sometimes troublesome. When difficulty is encountered, a mandarin or catheter guide may be used, or a double curve metal catheter may be passed. The thumb of the left hand should follow any instrument through the urethra and perineum until the tip is beyond reach when the index finger is inserted into the rectum. In this manner the end of a sound or catheter is constantly felt and therefore under control. Because a metal sound is rigid, its tip will do less damage than one with a flexible shaft. One must be doubly careful not to traumatize the urethra. Catheters of all sizes and shapes should be tried. However, if only one instrument is at hand, it should be a double prostatic curve metal catheter.

If decompression is to be done by gradually and constantly reducing the pressure of residual urine, Van Zwalenburg's³ method is used. This consists in forcing the urine through a long tube to a receptacle which is higher than the patient while lying in bed. An ordinary pail of one quart capacity or an iron enema can, 4 feet of rubber tubing with two glass connectors and a Y shaped glass tube complete this equipment. After the urethral catheter is in place, it is connected by one of the glass connectors to the 4-foot piece of rubber tubing. To the proximal end of this rubber tubing is attached an arm of a Y glass tube. The other arm of the Y is hooked over the edge of the enema can so that the base of the Y protrudes into the air. The height of the can is raised, so that when the patient inhales deeply, the urine comes out in drops. At this level, coughing will cause the urine to come in a stream for a few seconds following the cough. If the early signs of uremia, which are dry tongue, sleepiness and slowed mentality, are

not observed, the height of the enema can is lowered about two inches daily. In this manner, more of the residual urine is withdrawn each day, which reduces renal pressure. The second day after the bladder is completely drained, the patient is encouraged to get out of bed for a short time and as soon thereafter as his strength will permit he should walk around.

As soon as decompression is started, or better the day before, the patient should be urged to drink quantities of water. Five thousand c.c. is an average amount of intake. While the patient is in bed, continuous proctoclysis should be used. When the blood chemistry reveals a high urea and creatinin, the patient may take as much as 7,000 to 10,000 c.c. of water or fluids in twenty-four hours. Five hundred c.c. of 5 per cent bicarbonate of soda and 5 per cent glucose may be given every twenty-four hours. This solution should be given continuously if acidosis is feared. The intake and output must be carefully watched. The patient is encouraged to eat a full diet. Blood pressure and heart action are frequently tested during and after the decompression. If the patient has sufficient renal tissue to warrant operation, he will gradually improve in general physical condition.

In some cases there is an initial decline in the patient's general condition during the decompression so that the first signs of uremia are present. Urea and creatinin increase in the blood and phenolsulphophthalein output becomes lower than before decompression was started. When this occurs, the intake of fluids is increased, the heart muscle is stimulated and the pressure exerted by residual urine is not lessened or may be increased. The greatest medicine at this time is plenty of good water, which should get into the circulation by mouth, by proctoclysis, by hypodermoclysis or intravenously. As soon as the symptoms of approaching uremia have disappeared, the decompression is continued.

If the patient has insufficient renal tissue, his convalescence from decompression is stormy and slow. The blood urea and creatinin continue high, the phenolsulphophthalein does not increase and his general condition improves slowly if at all. Some patients may improve in general condition without improvement in blood chemistry and phenolsulphophthalein output. The prostatic's general condition and his ability to handle water after passing through thorough pre-operative treatment

are major indicators of his inability to withstand operation.

SUPRAPUBIC DRAINAGE

Routine two-stage operative technique is, in my opinion, a mistake. About 10 per cent of my patients require temporary suprapubic drainage. This



Fig. 3. Catheter anchored in urethra with snap in place which is used as a sphincter.

becomes necessary when a permanent urethral catheter cannot be tolerated, when the patient has a bladder stone or other complication and when it is impossible to prepare him so that his blood chemistry, renal functional tests and general condition approach normal within an average time. With a suprapubic drain, the patient is able to take care of himself better over a long period of time than with an urethral catheter. Gradual removal of residual urine may be practised with this method of drainage. The suprapubic tube may be introduced into the bladder through the cuff of a trocar and immediately clamped. Gradual decompression may then be started, the technique being the same as that used when an urethral catheter is employed. When suprapubic drainage is necessary, local anesthesia or gas is used. Blindly push-

ing a trocar through a skin incision and into the bladder should be avoided. The incision in the skin should be long enough so that the peritoneum may be pushed back if in the way and so that the bladder may be recognized before the trocar is introduced. In my experience, the mortality from suprapubic drainage during pre-operative treatment is higher than when a permanent catheter is used. It is possible that the incision opens additional avenues of absorption and that the opening into the bladder does not permit of complete control of the residual urine during decompression. Again the suprapubic space is exposed to infection, all of which may add extra hazards which are too much for the overburdened kidneys and heart to overcome.

EPIDIDYMITIS

Epididymitis is a troublesome complication, which may be prevented by ligating both vasa be-

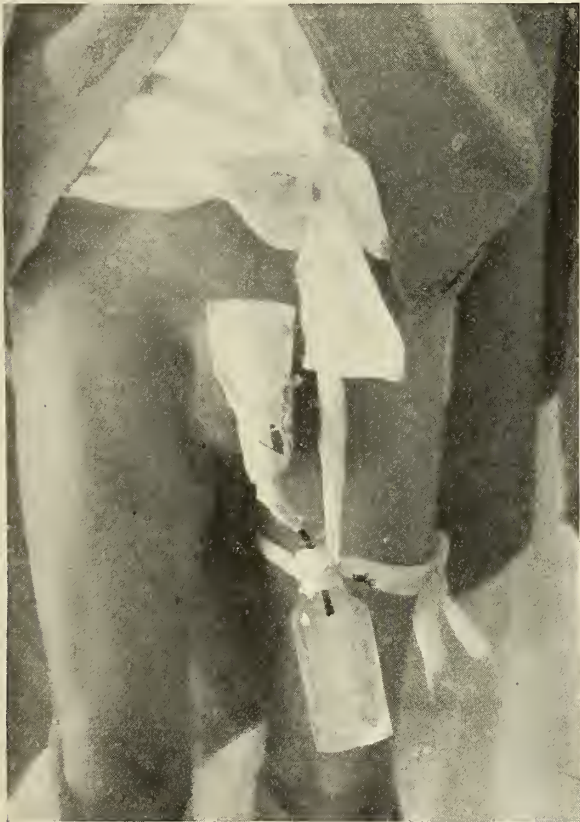


Fig. 4. Catheter anchored in urethra showing attachment of bottle for continuous drainage when the patient is ambulatory.

fore pre-operative treatment is started. This procedure is not permitted by all patients, even when they are told that most prostate operations produce

sterility. Routinely, I advise my patients to wear a well fitting suspensory bandage both night and day. Epididymitis always prolongs the pre-operative treatment at least two weeks. An ice bag and rest in bed are routine treatment for this condition. Occasionally, it becomes necessary to drain an abscess of the epididymis. In my experience, supuration is frequently present.

INFECTION

Infection in the urinary tract may be a troublesome complication during pre-operative treatment. Many deaths are caused by new or added infections in the kidneys, which condition overwhelms these already overburdened organs so that uremia and death result. Beware of the patient with a large amount of residual urine, which is clear and contains no infection. Such a patient after the least urethral or bladder instrumentation, may have a very severe reaction with chills, fever and the first symptoms of uremia. Patients with uninfected residual urine are not vaccinated or immunized against the ordinary organisms, which are always present in the bladder and kidneys. The introduction of a catheter not only introduces infection, but the trauma in the posterior urethra opens up at once avenues of absorption, which takes place quickly.

When renal infection occurs, dilution of the toxins is accomplished by the introducing of quantities of water. Urotropine used intravenously has been very helpful. I use Formatone, which is a trade name for the intravenous urotropine product. Mercurochrome 1 per cent may be introduced intravenously in severe cases. I use from 10 to 20 c.c. of this solution, the amount depending upon the weight of the patient and his general condition.

To control infection in the bladder and urethra, I inject through the permanent catheter two or three times daily 2 per cent mercurochrome. The catheter is clamped after each instillation for ten minutes, so that the mercurochrome cannot drain out at once.

HOSPITAL SURROUNDINGS AND NURSING

If the patient is away from home, provide amusement for him and see that he has men of his age to talk with. Many patients have given up hope and lost courage because of lonesomeness. Large hospitals that cater to urologic cases should have a small pavilion consisting of four to six sleeping rooms, one dressing room, sitz and tub baths, all

under the care of a carefully trained male nurse. Even where special female nurses are in attendance on one patient, a well trained, tactful male nurse should be on constant call. Such a man is invaluable if he is well trained. His duty is to make the old men happy and comfortable while they un-



Fig. 5. Beginning of gradual decompression. Van Zwahlenberg method.

dergo their long pre-operative treatment and post-operative convalescence. The replacement and cleansing of catheters, frequent changing of dressings so that the patient is free from odor, and all like attentions which tend to make these old men happy and contented, are important factors in shortening their convalescence.

MORTALITY

The operative mortality following prostatectomy has been reduced to an average of 3 to 4 per cent. Many urologists report series of 200 cases without a death. This is accomplished by pre-operative treatment and selection of cases for operation. It is difficult in the borderline group to differentiate a safe risk from a poor one, which judgment comes with experience. Patients in this borderline group, together with those who die from the accidents incident to any surgical operation performed on old subjects, constitute our operative mortality.

If all old men with hypertrophy of the prostate are considered, the total mortality will amount to about 20 per cent. This total mortality has not be-

come less in recent years. We have learned to separate the bad risks from the good ones, so that the operative mortality is low, but as yet we do not get the prostatic to the urologist early enough so that renal damage and damage to the heart from residual urine and infection may be prevented. Patients with hypertrophy of the prostate deserve better attention and should be considered for operation as soon as a diagnosis is made. All of us will agree that if we could operate upon the prostatic during the onset of his symptoms, or as soon as a diagnosis can be made, not only the operative mortality, but the total mortality would be less. The early operation is not only desirable, but will put back into active, useful life, 10 to 15 per cent of all patients who now die from this condition. Urologists feel that this is the step that will bring about further progress in their treatment of the prostatic.

TO SUMMARIZE

1. Prepare all patients with hypertrophy of the prostate before operation. This consists of: (1) complete general physical survey; (2) urologic study, to include roentgenography and cystoscopy; (3) reduction of residual urine and back pressure on kidneys by decompression; (4) attention to complications as heart action, blood pressure, infection, epididymitis, etc. This produces a readjustment in physical condition so that poor surgical risks from any cause are quickly recognized and are not subjected to prostatectomy.

2. Careful pre-operative treatment of patients with prostatic hypertrophy results in a very low operative mortality (less than 3 per cent) and a much reduced total mortality.

3. The operative mortality will be less than at present and total mortality greatly reduced if sufferers from enlarged prostate will seek relief early. The general practitioner should advise his prostate patients to submit to operation as soon as a diagnosis can be made.

CASE REPORTS

CASE No. 1.—R. E. J. Age 54.

Preliminary complaint was discomfort after eating, with burning pain in epigastrium and sour regurgitation. Frequent sufferer from hay fever.

Family History.—Negative except that one member of the family had died from cancer.

Previous Diseases.—Operation for appendicitis with no infection.

General Physical Examination.—Negative. A gastric an-

alysis and roentgen studies of the gastro-intestinal tract were made.

Diagnosis.—Ulcer of duodenum or gallbladder infection.

This patient was put on management and returned to his home. The management controlled his gastro-intestinal symptoms so that he was free from trouble until one month later, when he came into the hospital with acute urinary retention. At this time, he stated that for the past month he had had slight frequency. After this attack was relieved, the patient returned home and did not have another attack of acute retention, but did have frequency of urination every two hours with some dribbling. Following the passage of the catheter for the acute retention, he developed an acute epididymitis. Two months later he was examined again, at which time only one-half ounce of residual urine could be found. During the interval his physician has been irrigating the bladder so that the residual urine had greatly decreased. This patient at the time he entered the hospital did not have the usual pre-operative treatment, because of the small amount of residual urine. Fractional catheterization was done rather than constant drainage of the bladder. A cystoscopic examination was made which revealed a large bilateral enlargement of the prostate. There was cystitis and some trabeculation of the bladder. No diverticuli or stones could be seen. An x-ray examination of both kidneys, both ureters and the bladder was negative.

After twenty-four days of preparation, the blood chemistry, P. S. P. test and the patient's general condition had all improved so that we were sure he was a good operative risk. The usual suprapubic operation was done, the Pilcher bag was used to control hemorrhage and a suprapubic drain was put into the bladder. These were removed after forty-eight hours. The distension of the bag was relieved after twelve hours and after twenty-four hours. A catheter was put into the bladder through the urethra when the bag was removed. The bladder and the suprapubic wound were frequently irrigated with a solution of 2 per cent mercurochrome to prevent infection.

The patient was out of bed on the fifth day and convalesced very rapidly. His wound healed quickly, but opened a few times and on the twenty-second day following operation was completely healed. The patient's post-operative history is good. He says that he has no frequency of urination and he is able to urinate freely and without trouble.

Urinalysis when the patient was first seen was negative. Following the acute retention, there was a quantity of pus and albumin. Pus was continuously found in the urine during the operation and for a few weeks following the removal of the prostate. At the present time the urine is free from pus. The first blood chemistry showed a creatinin of 1.5 and urea nitrogen of 25.3. Two weeks later urea nitrogen had decreased to 23.9 and creatinin 1.8. Nine days later urea nitrogen had decreased to 19.9 and the creatinin to 1.6. P. S. P. test taken on entrance showed 20 per cent in two hours and increased to 47.5 per cent one week later.

I wish to call attention to the age of this man and to the fact that he was operated upon shortly after his first attack. His bladder and kidneys were not infected, as is usual with old standing prostatics. His bladder was not distended, so that it had not lost all of its tone. This is evidenced by the

complete relief which this patient has had following his operation. His general health is excellent and his only complaint at this time is an occasional upset with his stomach, which is controlled when he uses bismuth and soda.

CASE No. 2.—E. S. Age 71.

Family History.—Practically negative.

Past Illnesses.—Typhoid at age of thirteen, otherwise negative. Married forty-two years and has two children. Habits are good—uses tobacco moderately and no alcohol. No history of venereal disease.

Present History.—Began five years ago, at which time patient first noticed frequency of urination. Six months before operation, the frequency had increased to once per hour. At one time the patient urinated twenty times at night. No blood or pus was noticed. During the last year and a half, the patient's condition was poor. He had lost weight and strength.

Physical Examination.—Skin had a yellowish tint. Patient had a dry tongue and looked sick. He had no control of his abdominal muscles, which were constantly contracted. The heart and chest examination was negative, including fluoroscopy. Teeth were all false. Prostate felt by rectum was enlarged one and one-half on a scale of four, not nodular or firm. Blood pressure was 150/95. Blood chemistry when the patient was first examined showed urea nitrogen 44.5—creatinin 4.1. Hemoglobin was 54. Urine contained four plus albumin and too many pus cells to count in the high power field.

This patient was sent to the hospital and gradual decompression was done. X-ray did not show evidence of stone in the kidneys or bladder. He was not cystoscoped because his condition was poor and this examination might precipitate an attack of uremia. With the permanent catheter anchored in the urethra and with the Van Zwalenburg method, the residual urine was gradually removed. Two days following the introduction of the catheter, the patient's condition was not good. His tongue was dry and his mentality was dulled. His appetite was gone and he looked badly. At that time the urea nitrogen had ascended to 123.9, the creatinin had decreased to 3.0. When the decompression was started, this patient was given no less than 5,000 c.c. of water per rectum and by mouth. After seven days, the pressure had been gradually reduced, so that the urine was allowed to come out normally. Ten days following the beginning of the decompression, the blood urea had decreased to 96.9 and the creatinin to 2.9. The patient was allowed to get out of bed, but his intake was constantly watched so that he averaged 6,000 c.c. of water in every twenty-four hours. Seventeen days following decompression, the urea nitrogen had dropped to 83.4 and the creatinin to 2.3. This patient's blood pressure was frequently taken and was not found to be above 150 systolic. The patient's condition improved so that the twenty-second day following his decompression, he was allowed to go home with a permanent catheter still in the urethra. He returned to the office in a week, at which time his pulse was irregular and the patient was somewhat fatigued. More rest was prescribed and the patient slowly regained his strength, his appetite and his courage. The catheter in this patient was not removed, although the end of the penis had to be cleansed frequently and the adhesive strips were replaced when they became

loose. Forty-one days following the beginning of the decompression, this patient was operated on. We used nitrous oxide and local infiltration anesthesia. The prostate was enucleated without trouble. A Pilcher bag was used to control the hemorrhage.

Before operation, his physical condition was again checked by the internist, who found the heart muscle and blood pressure in good condition. Following operation, the intake and output were carefully watched and there never was evidence of kidney insufficiency. The patient's post-operative course was uneventful and there was practically no bleeding. The wound healed so that the patient left the hospital on the twenty-seventh day. This case illustrates the danger of waiting until kidney damage has occurred before advising operation. This patient had just enough kidney tissue to withstand pre-operative treatment and operation. The reaction which occurred following the introduction of the catheter worried us a great deal and we were fearful that we were going to lose the patient.

CASE NO. 3.—A. T. S. Age 68.

Was first seen May 1, 1922, complaining of urinary incontinence, difficulty of urination and hemorrhoids. This patient's previous history as far as illnesses were concerned, was practically negative. Denied venereal infection. Father of three children. This man had been complaining for the last year and a half of frequent and difficult urination. He had some dribbling after passing his urine, and at times the trouble in starting was very severe. He developed hemorrhoids, which were operated elsewhere. Upon two occasions he had retention, so that a catheter had to be used to drain the bladder. His frequency became so great that he developed incontinence at night. The patient is a man who has worked very hard all of his life, although he has not been an alcoholic and has not otherwise abused himself.

Physical Examination.—Showed blood pressure of 198/96. There were many and varied senile changes. The heart tones were distant and of poor quality. There were some extrasystoles. This man had an arteriosclerosis of three on a scale of four. The prostate was enlarged, but was not nodular when felt per rectum. There was a small, hard nodule in the tail of the left epididymis. X-ray examination of the kidneys, ureters and bladder was negative. Cystoscopy revealed an enlarged prostate two on a scale of four. The bladder was very much trabeculated and there were a number of diverticuli. As the patient had been using a catheter very freely himself, we were unable to estimate the total amount of residual.

Diagnosis.—Chronic hypertension; cardiac hypertrophy; relative mitral insufficiency, a generalized, advanced atherosclerosis and hypertrophy of the prostate.

The blood chemistry at the first examination showed urea nitrogen 10.5 and the creatinin 3.2. P. S. P. test in two hours was 17 per cent. Because of this man's senile changes and the poor condition of his heart, we advised suprapubic stab drain, which would thoroughly drain the bladder and relieve the infection, after which operation might be considered. We advised suprapubic cystotomy in this case rather than a permanent catheter because we were sure that a very long pre-operative treatment would be necessary and did not feel that the patient could care for himself if he had a permanent urethral catheter. The patient refused

operation at first, so that for one month he catheterized himself when he was unable to pass his urine. At the end of this time a suprapubic stab drain was done. This patient's improvement was very slow, as is evidenced by the reports of the blood chemistry and P. S. P. which are appended:

Urea nitrogen	10.5	mgm.
Creatinin	2.30	mgm.
P. S. P.	17%	
Urea nitrogen	33.75	mgm.
Creatinin	5.30	mgm.
P. S. P.	20%	
Urea nitrogen	19.5	mgm.
Creatinin	3.60	mgm.
P. S. P.	25%	
Urea nitrogen	24.5	mgm.
Creatinin	6.75	mgm.
P. S. P.	18%	
Urea nitrogen	42	mgm.
Creatinin	6+	mgm.
P. S. P.	21%	
Urea nitrogen	13.00	mgm.
Creatinin	1.20	mgm.
P. S. P.	20%	

This patient's general condition improved so that he was able to work around his house without edema of his legs and without other discomfort. He was able to eat and sleep well and gained in weight. Five months after beginning his pre-operative treatment, a check-up of his physical condition, together with his blood studies, indicated that this man was a fit subject for prostatectomy.

Under gas-ether anesthesia, the suprapubic opening was enlarged and a digital enucleation of the prostate was done. In spite of this old gentleman's very poor condition, his post-operative convalescence was good. From our experience, we find that when patients are thoroughly prepared, the operation and the convalescence from operation are usually uneventful. They are not troublesome when compared to the stormy times that we sometimes have when attempting to decompress the bladder and the kidneys. The suprapubic opening in this case was slow to heal permanently, so that the patient remained in the hospital until we could discharge him with healed suprapubic opening and without a catheter. This occurred on the forty-seventh day. This man has been seen many times since the operation and his physical condition has remained exceptionally good. He still has some frequency of urination and a slight amount of residual urine, which is to be expected when one remembers the large trabeculated bladder which he had when operated upon.

CASE NO. 4.—C. O'C. Age 76.

Family History.—Negative.

Past History.—Negative. Denies venereal infection.

Present Complaint.—Frequency of urination for eighteen years. One week before examination he had acute retention of urine and had to be catheterized. He said that he had passed gravel at times and that blood was noticed when a catheter was used.

Physical Examination.—Revealed a cachectic, senile individual with a blood pressure of 140/90. The patient had a left inguinal hernia with some enlargement of the in-

guinal glands. There was some senile emphysema. The heart was not enlarged, but there was sclerosis of the aorta. The internist made the following diagnosis: Pyorrhea; general arterial sclerosis; left inguinal hernia and hypertrophy of the prostate.

This patient was immediately referred to the hospital for pre-operative treatment. The first blood chemistry revealed a creatinin of .55 mgm. per 100 c.c. and an urea nitrogen of 11.5 mgm. A permanent urethral catheter was put into place and the patient was given quantities of water—average 6,000 c.c. in twenty-four hours. After three days the patient got out of bed without permission, so that the decompression could not be continued as desired. At this time, the urea nitrogen had increased to 30.5 with creatinin 1.2. The patient was allowed to walk around the hospital with a permanent catheter, which completely drained the bladder. His P. S. P. tests were repeatedly low and never higher than 40 per cent. The patient's general condition improved very rapidly under pre-operative treatment, so that twenty-eight days following, his condition had improved, so that he was eating and sleeping well and had no complaint. The blood chemistry remained good and the P. S. P. had not decreased.

This patient was operated upon by sacral-block and local infiltration. The Pilcher bag was used, but was removed on the second day. A catheter was put into the bladder through the urethra. The suprapubic wound was healed on the tenth day. The wound opened again on the thirteenth day, after which it healed and stayed healed. This man was very arteriosclerotic and had a very long history, although he did not have the usual large amount of residual urine. It is probable that some of his prostate complaint was due to arteriosclerosis. At the present time the patient has to urinate two or three times at night, although he has no residual urine and still has a slight amount of pus in the urine. This man had symptoms over a long period of time so that his bladder was greatly distended and lost its tone. His kidneys and his bladder were infected so that he will probably always have some urinary frequency. His general condition has improved so that he is able to do hard work.

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DISCUSSION

DR. H. C. BUMPUS (Rochester): I want first to compliment Dr. Thomas on his very clear and thorough paper on this subject. There isn't much that can be added, but I think there are a few points which can be improved by emphasis.

First, the important facts relative to prognosis that may be gained from a general examination. For several years we have made routine electrocardiograms in all prostatic

cases and so discovered unsuspected cardiac lesions that absolutely contra-indicated surgery in a number of patients, and in others the life expectancy is evidently so brief as to hardly warrant surgery.

Second, we do not feel that a routine cystoscopic examination is indicated in all patients with prostatic hypertrophy. If routine roentgenograms of the urinary tract are made the presence of calculi will be ascertained and a routine cystogram will demonstrate any unsuspected diverticulum. Therefore we reserve cystoscopy for those patients in whom the size of the gland examined through the rectum is not sufficient to explain the symptoms.

Third, this procedure has enabled us to discover many cases of early tabes when the bladder symptoms were the first evidence of the disease, but more important is the greater number of patients with various types of so-called cord bladder. Neurologic examination in these cases will frequently be negative, yet the nervous mechanism of micturition has undergone unmistakable pathologic changes, and surgery for its relief will only end in disappointment.

Fourth, this thorough urologic examination also reveals the prostate that is enlarged as a result of chronic infection, rather than adenomatous changes. The surgical removal of such glands is frequently followed by the lighting up of the old infection, which quickly involves the vesicals and aggravates the symptoms rather than lessening them. Such cases are better handled by the punch operation which removes only the obstructing portion.

DR. EDWARD BRATRUD (Warren): Dr. Thomas has given us a very clear, logical and concise outline of principles essential to success in surgery of the prostate. This is very gratifying as heretofore the discussion of prostatic surgery has revolved chiefly around operative technique and the choice of two operative routes. The importance of this is evidenced by the fact that deaths in these cases mostly follow the preliminary operation and are usually due to poor preliminary preparation of the patient.

I wish only to emphasize a few of the points so ably brought out by Dr. Thomas:

1. Stress on examination, in ruling out tabetic bladder, diverticulum and medical diseases.

2. Given prostatic obstruction from whatever cause: adenoma, carcinoma, acute inflammation, median bar or contracture of the vesical neck, we get the same typical group of symptoms in each and the preoperative treatment that Dr. Thomas brought out is essentially the same.

3. Patients often get a tremendous relief of symptoms by removal of a small bit of the obstructive tissue, in selected cases, but the pre-operative treatment is essentially the same.

4. In our clinic at Warren, we attach considerable importance to the specific gravity of the twenty-four hour specimen from day to day.

5. We have quite a number of cases of prostatic obstruction coming in with acute retention, with the bladder almost to the umbilicus and having frequently suffered considerable trauma to the urethra in an attempt at catheterization. Our practice in these cases is to insert a 3.5 inch, 22 caliber needle into the bladder, going through the skin horizontally so as not to cause pressure on the bladder, and then allowing the bladder to empty

itself drop by drop. The needle can be reinserted frequently and the patients seem to react very nicely. In three or four days we can usually insert a urethral catheter.

Some of these cases have been previously catheterized with complete emptying of the chronically distended bladder and we get them in shock, with bloody urine and impending uremia, and considerable infection in the posterior urethra, and the greater number rapidly pass out.

DR. W. F. BRAASCH (Rochester): The admirable paper presented by Dr. Thomas has brought to our attention the more modern methods of preliminary treatment for prostatectomy. This consists largely of two factors, namely, the increase in our knowledge of renal functional tests, and the realization of the great value of preliminary drainage. In the days when we did not have the present functional tests, we used such good old-fashioned methods as the patient's general appearance, his general feeling and his appetite, and they still remain excellent factors in estimating the patient's renal function.

Unfortunately, however, a good many patients will feel and appear well and have a good appetite even when their kidneys are badly damaged. It is in this group, possibly 10 or 15 per cent of the cases, that the renal functional tests are absolutely necessary in order to discover the degree of renal obstruction. We have found that retention tests, such as the estimation of blood urea, is of more value than excretory tests, such as the phenolsulphonephthalein test. The possibilities of retention and technical error are so great with the phenolsulphonephthalein test that one cannot routinely rely on its accuracy, whereas it is comparatively easy to get an accurate estimate of the renal function with the present simplified methods of estimating the blood urea or creatinin.

As Dr. Thomas has said, a part of the reduction in mortality accompanying prostatectomy has been accomplished by transferring it to preliminary drainage. It is not generally realized how dangerous a procedure preliminary drainage may be. A few years ago mortality resulting from preliminary drainage was higher than that following prostatectomy. However, realizing the value of gradual decompression and the other methods of treatment mentioned by Dr. Thomas, we have greatly reduced the mortality resulting from preliminary drainage. Nevertheless, unless all precautions are taken, pre-operative drainage remains a dangerous procedure. If anyone believes

that the introduction of a permanent catheter in a bladder which has retained a large amount of urine for a long time is a simple procedure, he will find from experience that it is not. He will find that it, rather than the operation of prostatectomy, often constitutes the danger period. If, however, drainage is carefully carried out with all the accessories of hospital treatment, such danger will be greatly reduced. If renal functional tests are also used, particularly the blood urea test, the mortality rate for prostatectomy should be reduced to well under 5 per cent.

DR. THEODORE SWEETSER (Minneapolis): There are just a few points that I want to bring out from my experience at the Minneapolis General Hospital and at St. Mary's Hospital in Minneapolis. I would not like to say that these are necessarily Dr. Owre's views, but some of them would meet with his approval, since I have been working under him. The reviews that we have at St. Mary's Hospital and the clinical pathological conferences that we have there every week have helped a great deal in bringing out the importance of the pre-operative treatment and study of these prostatic cases and in showing that really the pre-operative treatment and study have been more important, if anything, than the operative technic, and that if the pre-operative study is carried out carefully the patients get along very well. Since making a review about two years ago at St. Mary's on these prostatic cases I have noticed that there have been practically no cases that have been taken into the hospital and operated on very soon after their entrance. There has been plenty of time taken for the pre-operative study.

In the examination of the urine, I remember in looking up this review I found one case that entered the hospital some years ago and the patient had diabetes and died afterwards without a very careful study. I wanted to bring out that these diabetics can undergo prostatectomy if sufficient time and care are given beforehand. We have had two cases that went through very nicely and are still living and comfortable.

In regard to the blood functional tests, I believe that the blood tests are the most important, and I would like to ask the essayist about the importance of creatinin and the urea, the proportionate importance. I have felt personally that the creatinin content of the blood was the most accurate. We had one patient in whom on the diet the urea content came down within twenty-four hours or so, and the creatinin turned out to be the more accurate index.

THE DANISH GOLD TREATMENT OF TUBERCULOSIS

Hardly a year passes but that the announcement is made of some new method of treating tuberculosis. The most recent method to receive sensational publicity duly accorded any venture in the treatment of tuberculosis is a preparation of gold advanced in Denmark under the name "Sanocrysin." At a meeting of physicians in Denmark, Professor Moellgaard, the originator of the remedy, described its production and its effects. Other physicians gave an account of their results with the treatment. Several deaths from the remedy were reported. It is stated that Professor Moellgaard was the most cautious of all who spoke. (*Journal A. M. A., Dec. 13, 1924, p. 1928.*)

KAFFEE HAG

Kaffee Hag was found to contain 0.03 per cent of caffeine and 11.47 per cent of caffetannic acid, which agreed with the claim made for it, that 95 per cent of the caffeine was removed. A later analysis showed Kaffee Hag to contain a somewhat larger amount of caffeine, namely 0.12 per cent. A still more recent examination showed the presence of 0.09 per cent caffeine. Assuming that the average coffee contains 1.25 per cent caffeine, the amount of caffeine remaining in Kaffee Hag should be close to 0.06 per cent to agree with the claim that 95 per cent of the caffeine is removed. (*Jour. A. M. A., Jan. 24, 1925, p. 306.*)

TRACING INFECTIONS IN A SURGICAL SERVICE*

ARTHUR N. COLLINS, A.B., M.D., F.A.C.S.

AND

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A great many standardized hospitals today have a "hospital analysis sheet" compiled every month and read at meetings of the staff for information of its members. In this "hospital analysis" there is a clause dealing with the number of infections occurring in surgical service during the month. During the past winter, at one time, the hospital analysis at St. Luke's showed a considerable increase of infections and an inquiry was made into the cause of these infections. Co-operation among the surgeons is a great help in such an inquiry. Some of these reported infections occurred in operations most carefully performed. Cultures repeatedly taken from wounds healing apparently very well, but showing a pearly bleb at one point in the wound, invariably yielded a bacterial growth from the serum and this was usually staphylococcus. Wound infections complicate and prolong convalescence and every effort should be made to eliminate them.

Investigation of this problem involved a search touching upon the operation of the sterilizer, the condition of the draping material, gowns, towels, lap sheets, wash cloths, sponges, and other materials, as well as rubber goods coming in contact with the operation, such as rubber wicks, drains and gloves. It also involved the method of handling instruments and the preparation of the hands and the patient's skin.

A short period of observation in the operating room disclosed a few loop-holes and these were jotted down.

Carelessness on the part of an operator is occasionally responsible for some infections. In spite of the most scrupulous care on the part of the operating room staff and rules concerning the preparation of materials, these safeguards will be entirely offset by a drop of perspiration running off the tip of the nose or from the forehead onto the sterilized linen. These, of course, are only

preventable by the individual surgeon and attention is called here to this fact so that those who run may read.

The sterilizer was first investigated. Cultures were made from the centers of large packages and from the centers of small packages. The results showed positive cultures from the centers of large packages, but from the centers of small packages the cultures were persistently negative. Hence, the sterilizer was taken down and an investigation of the circulation made. In the overhauling process it was found that one of the pipes was plugged and that the steam circulation was poor. This was remedied and cultures again taken after sterilization were all negative successively. Cultures were made of all rubber wick and drain material and these were negative. The gloves were not cultured but the glass indicators placed with the gloves in the autoclave were persistently negative and the gloves were regarded as sterile.

It was then undertaken to ascertain some of the other methods by which an infection might creep into an otherwise sterile operative case. On one occasion an operator frequently coughed into his mask in the direction of the wound while he was working. It was suggested that this matter be investigated as to the possible cause of infection here. Therefore, a thick mask was placed over the mouth and the experimenter coughed through it over a culture plate several times and the plate was then placed in an incubator. Also the same individual breathed several times from the uncovered nostrils over the surface of a culture plate and this was placed in an incubator also. As one might well expect, both of these cultures were positive and gave rich growths of bacterial colonies.

It was next undertaken to discover whether the method of sterilizing the hands before putting on the dry gloves was efficient and the following method was resorted to. Cultures after scrubbing were made in several instances from the ungloved hands, under nails and cuticle, of both operator and nurses. The results will be seen as tabulated in Table I.

It was also noted on several occasions that when the gloves were removed from the hands of the surgeon one or more bloody fingers would be shown underneath the glove indicating a punctured glove at that point. These stained fingers also were cultured to see what could be grown from

*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, October, 1924.

them. Results of this experiment also will be found in Table I.

In order to focus the searchlight of suspicion upon the particular offending fingers an attempt was made to ascertain the greatest number of punctures per finger. Therefore, a chart was drawn and placed in the work-room where the gloves are repaired. Each time a puncture was found, a mark was made by the nurse, opposite the finger on the chart, showing on which finger the puncture was found. This record was kept for a month or more and the figures were then combined and tabulated.

thirty punctures or tears would average only one puncture to three nurses. This, however, is as it should be for there is very little excuse for puncture of the nurse's glove. The surgeon's gloves, however, are exposed to the danger of wounding throughout an operation.

The contents of this paper do not, by any means, represent all the dangers threatening asepsis. Placing of sterile gloves under the arms, the handling of any unsterile object with a single sterile towel, or operating on an unsterile table top covered with sterile towels which have become soaked through is to be condemned from an aseptic viewpoint.

TABLE I

Name	Med.	Cuticle	Nail	Nose	Fore-head	Cough	Nasal Breath	Punct. Finger
Dr. A	Agar	— Before Op.	— Before Op.	+ Post-op.		+ Plate	+ Plate	
Dr. B		—	— Before Op.	+ Broth		+ Plate	+ Plate	
Dr. C		— Before Op.	— Before Op.					
Dr. D		— Broth	+ Post-op.					
Dr. A			— Post-op.					+ Post-op.
Nurse X			+ Broth					
Nurse X			+ Post Scrub					
Nurse Y	Broth		+ Broth	— Agar	+ Agar			
Controls All Negative								

The results, as may be seen from Table II, disclose that the index finger of the glove is most often punctured, the middle finger coming next. The ring and little fingers are in least danger. The right gloves show more punctures than the left.

Assuming that the seven, seven and one-half and eight sizes were worn by the sixty-five surgeons, and the total punctures or tears in this group seventy; then the number of punctures per operator would be 1.7.

Assuming that all the six and one-half size were worn by the eighty nurses, one may see that the

CONCLUSIONS

1. Thumb, index and middle fingers, especially of the right hand, should be most carefully scrubbed and possibly dipped in a strong antiseptic solution and allowed to dry before gloves are put on. Tincture of iodine or Harrington's solution, or Thymol (5%) in alcohol (60%) have been suggested for this purpose.
2. A punctured or torn glove should be changed at once.
3. More instrumental skill should be cultivated in order to prevent wounding of gloves.

4. The surgeon or nurse should never proceed with wounded gloves. The gloves should be scrutinized carefully for punctures two or three times during operation.

5. Nurses should be very careful in handling instruments not to puncture or tear the gloves. At the stock table they should handle instruments only with sterile forceps. At the operating table nurses should not touch instruments with the gloved hand except when absolutely necessary.

TABLE II
GLOVE SIZES

Digit					
Left	6½	7	7½	8	Total
Little	2	1	0	0	3
Ring	1	1	2	3	7
Middle	3	3	6	0	12
Index	3	4	5	5	17
Thumb	4	0	7	0	11
Right					
Thumb	3	0	8	2	13
Index	8	3	13	1	25
Middle	4	3	4	1	12
Ring	2	0	2	0	4
Little	0	1	0	1	2
	30	16	47	13	

76

Total number of surgeons operating—65.

Total number of nurses assisting—80.

DISCUSSION

DR. THEODORE SWEETSER (Minneapolis): There is just one little point that I want to bring out. About a year and a half ago at St. Mary's Hospital in Minneapolis we had an increase in infections on the surgical service but there were no serious infections. We tried to look up the cause and after eliminating practically everything else we studied the alcohol that the surgeons were using for soaking their hands in after they had scrubbed. Of course we know that hands that are scrubbed with soap and water are not necessarily completely sterile. In studying this alcohol we found that

as many as four or five, that is the nurses and all the surgeons connected with the case, had been using the same dish of alcohol. We studied the specific gravity of the alcohol and found that after the last one had used the alcohol the strength had dropped down from the 70 per cent which we considered the correct per cent to 30 or 40 per cent or in some cases even less. We used more dishes of alcohol among those taking part in the operation and tested it very frequently for specific gravity, and the number of infections dropped very promptly after that.

DR. A. N. COLLINS (Duluth): I am very grateful for the discussion. I do not think it makes much difference what the type of the growth is. We do not want infection at all, we want a clean wound. That is the ideal to be striven for. If we get infections there is something wrong somewhere. If we are going to standardize hospitals we might also begin standardizing our results from a wound healing standpoint. Streptococcus, to be sure, may not be a very fatal type of infection provided it gets into the right individual, but it may prolong the stay of the patient in the hospital.

The alcohol bath, which I consider the best type of antiseptic to be used on the hands after scrubbing, as one member has just suggested to us, is one of the variable factors which we should not neglect. I know that alcohol which is used daily is often taken after the morning's work including water drippings from the hands, filtered through some cotton, placed in a bottle and put back for use the next day. I venture to say if it were tested occasionally we would find that we have mighty little alcohol in it. There has been a great deal of speculation as to whether 75 or 80 or 90 per centages of alcohol are as efficient as the lower ones in sterilizing the hands. I am not prepared to answer this. I am inclined to use a medium percentage rather than a higher on account of the evaporation.

Of course we might have drawn several conclusions from our paper. However, it is not necessary to state the self-evident conclusion that it is unsafe to cough through the mask in the direction of the wound or to breathe through the nostrils continuously in the direction of the wound. It is done all the time and we might just as well confess it.

There are some other things we are trying to do. For instance, it has been suggested that the moment we make an incision, even though the skin is all sterilized and plastered over with two or three coats of iodine, that when that incision is first made you loose into the wound certain bacteria that are in underlying layers and are squeezed out from the sides. The pressure of the knife in addition to the cutting releases the bacteria. Our custom is to throw aside the knife used for the skin incision and use a fresh knife deeper down. We are beginning now a series of cultures on wounds immediately after incision.

CLEERO

This is labeled "the vanishing shampoo." It is another piece of cosmetic quackery put out by the Van Ess Laboratories, Chicago. Cleero is sold with the claim that the use of soap on the hair is dangerous and that "the free alkali present in most soaps" makes them still worse. The A. M. A. Chemical Laboratory analyzed Cleero and found it to be essentially a perfumed watery solution of soap with free alkali and glycerin. (*Journal A. M. A.*, Nov. 15, 1924, p. 1607.)

SOMNOS

Somnos is marketed by the H. K. Mulford Co. It was investigated by the Council on Pharmacy and Chemistry in 1906. The committee that made the investigation was unable to find that Somnos was less toxic than hydrated chloral or that it had a less depressing effect on temperature, respiration or circulation. On the contrary, the physiological effects were indistinguishable from hydrated chloral. (*Jour. A. M. A.*, Jan. 10, 1925, p. 136.)

THE REPORT OF A COMMITTEE TO INVESTIGATE THE CULTS

More than a year ago a committee of the Massachusetts Medical Society prepared and presented a comprehensive report in which the advisability of a careful and exhaustive investigation of the methods of the cults was suggested. The committee was continued and has undertaken some investigations. Its final report, made to the Councilors of the Massachusetts Medical Society, appeared in the *Boston Medical and Surgical Journal*, Oct. 25, 1923. The committee attempted (1) to learn what is the underlying pathology of lame backs and why they are in some instances benefited by osteopathic treatment; (2) to find out if there is any value in osteopathic treatment in well understood diseases; (3) to ascertain if the so-called osteopathic lesion along the spine is a constant and specific one for different diseases of known pathology.

The first undertaking was abandoned, after an attempt to have some investigations made jointly by the orthopedic department of the Massachusetts General Hospital and some osteopaths. So the committee had nothing to report on that.

To determine any possible value in osteopathic treatment in well understood diseases, treatment by osteopathic manipulations was started in the wards of the Peter Brent Brigham Hospital, but the patients so treated did not stay in the wards long enough for the treatments to be satisfactory from the point of view of the osteopaths, and so that form of investigation was abandoned. Finally, however, an osteopath worked on a group of eight cases of "so-called" asthmatic bronchitis, and gave them a satisfactory number of treatments. In reply to letters sent them, four of the eight patients have stated that they have felt improved since they had the osteopathic treatments. The committee regrets "that further work could not have been done under carefully controlled circumstances on cases in which the degree of improvement could be measured by some more exact standards than the personal feelings of the patients and in diseases in which the course of events is a little less variable. Such an investigation, however, did not seem to be practical with the force available."

The failure to secure results in the first two undertakings was not so marked in the third, because developments of interest to the committee ensued. Two members of the staff of the Peter Brent Brigham Hospital and three osteopaths conducted this study, which was made to ascertain if the so-called osteopathic lesion along the spine is a constant and specific one for different diseases of known pathology. The two staff physicians "endeavored to learn" from the osteopaths how to detect the presence of the "osteopathic lesion." A series of cases were then studied for the "lesion," with two or more of the group of workers

examining independently each patient. The diagnosis was not known at the time of the examinations. About 180 cases were studied in this manner, including diabetes mellitus, cardiac disorders, respiratory tract infections, gastric lesions, chorea, pernicious anemia, hypertension, psychoneurosis, and a few cases later diagnosed as "no disease." "One or more so-called osteopathic lesions were detected at various points along the spine in each case," says the report, "but there was no specificity of location of the lesion for a given disease." In a considerable group of the cases examined, the two osteopaths, working independently, agreed on the location of the lesion in only 12.5 per cent of the cases. The committee concludes, therefore, that the study "seems to show not only that the osteopathic lesion is a difficult one to detect even by experienced osteopaths, but also that there is no specific lesion along the spine for a given disease."

The Massachusetts committee "feels that considerable doubt must be thrown upon the theory of osteopathy" and that "although osteopathic procedures seem to have some value as a therapeutic agent in certain *conditions* it has not been made clear how this benefit is derived; and, further, that the existence of osteopathy and chiropractic, "although based upon false theories, probably in part flourish from the failure of the medical profession to give due importance to physiotherapy." The committee "urges that the medical profession and the medical schools of the country pay more attention to this form of therapy," and asks to be discharged.

One who has known of the work of the Massachusetts committee can but have been impressed with the earnestness with which they went about the investigation they were appointed to undertake, but one wonders if anything more than has been reported could possibly have come from such an investigation. The wooden handle cannot be welded to the pewter spoon; no more can trained physicians satisfy the viewpoint of the cultist with whom they may be called to work in such investigation, nor can the cultist, if he believes what he preaches, satisfy the viewpoint of the trained physician. When it's all done, one is reminded of the story of the hard-working negro woman who went to the county fair with her worthless spouse. Soon after their arrival at the fair grounds, the aforesaid worthless spouse persuaded his better half to entrust him with a dollar and then promptly disappeared from her sight. After a long search she located him astride a wildly rocking horse on the flying jenny, otherwise known as the merry-go-round. She waited his descent therefrom and demanded to know what had been done with the dollar, only to be told that he had spent it riding on the flying jenny. "Uh huh!" she exclaimed, "you done ride up a whole dollar an' whar you been?"—A. M. A. Bulletin, Nov., 1923.

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION,
SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN
MINNESOTA MEDICAL ASSOCIATION, AND MINNE-
APOLIS SURGICAL SOCIETY

Owned and Published by
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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VIII MARCH, 1925 No. 3

EDITORIAL

Changing Views As To the Cause of Diseases of the Mind

If diseases of the mind still remain more or less a field of mystery and of misunderstanding, it is certainly not due to any lack of age, for the conception of disease of the mind was recognized in the earliest period of which there is any record and one sees reference to it, for example, in Saul's recurring periods of depression and in Ulysses' simulation of insanity to avoid service in the Trojan war. In all these early days, the insane

were looked upon as possessed by spirits, and usually evil spirits. In the later Greek and Roman civilization, there was some advance in treatment, and drugs, baths and exercises were employed. Hippocrates (about 460 B. C.) even taught that the brain was the organ of the mind and that insanity must, therefore, be the result of some disturbance in the brain, the essential of our modern physiologic conception of insanity. But, in the second and third centuries of the Christian era, and all through the middle ages, there was a marked regression. All thought of the physiologic conception was lost sight of and theories of demoniac possession, sorcery and witchcraft held sway over all the civilized world and it was only after many centuries that the insane man came to be looked upon as a sick man.

In the nineteenth century, with some impetus to the study of anatomy and physiology of the brain, the physiologic conception became well established. If Gall were living today, we should certainly call him a quack, though he is undoubtedly the father of the view that the brain cortex is the particular organ of psychic activity and that the different parts of the cortex do not constitute a uniform structure, either anatomically or functionally.

Though for many years the physiologic conception has held unquestioned sway in the medical world, its position has recently been contested by what is called the psychologic conception. This conception assumes that mental processes can be studied without any reference to anatomical changes, which may or may not accompany them in the brain. The study is from the standpoint of psychology and the various abnormal phenomena are looked upon as merely states of mind. Though the physiologic conception has been held by practically all the medical world for many years, it is only fair to state that hopes founded on it have not been fully realized and this is probably one reason why the psychologic conception has recently shown such a lusty growth.

In the physiologic field, no one has proven a more zealous worker in recent years than Dr. Henry A. Cotton, of the Trenton, New Jersey, State Hospital. In repeated publications he has urged on the medical profession views in reference to the rôle of infection in the psychoses which are as radical as they are positive. Cotton deprecates the views on heredity, held by the ordinary medical

man, as destructive of all hopeful effort. He admits the importance of states of mind only insofar as they lessen the patient's resistance to infection and he believes the various emotional factors of importance only insofar as they exercise an unfavorable influence on the ductless glands. Such evil influence as is exercised by the ductless glands occurs largely through their infection and, in the limited number of cases in which he has failed to effect a cure, he attributes a certain proportion to those instances where infection of the ductless glands has not been removed.

Streptococci and colon bacilli are the most important organisms encountered and dental infections were the first ones subjected to elaborate study and treatment, but the field of operation has since been greatly widened and now includes the teeth, the tonsils, the gastro-intestinal tract, the cervix uteri and the seminal vesicles.

Even teeth only under suspicion are extracted, and impacted teeth are considered always infected and, therefore, proper objects for extraction. Infected tonsils are removed, irrespective of the age of the patient. Removal of the teeth and tonsils is followed by vaccine treatment and the use of anti-streptococcus and colon bacillus sera. If, with these treatments, the patient fails to recover, further investigation is made of the gastro-intestinal tract and, if found diseased, operation for removal of the infected portion of the colon is the next procedure. Attention is also given to the cervix uteri and the seminal vesicles.

With these methods of treatment, Cotton claims a rise in the recovery rate in his institution from 37 per cent to 80 per cent and he considers the increase of 43 per cent in recovery as due entirely to his method of removing infection.

Unfortunately, other workers along more or less similar lines have failed to reach equally satisfactory conclusions. Thus, Kopeloss and Cheney, at the New York State Psychiatric Institute, have failed to see any difference, whatever, in a group of patients from whom infected teeth and tonsils were removed as against another group in which no such procedures were undertaken. Naturally, Cotton charges that the work of these men was inadequate and, presumably, incompetent.

Naturally, only time will reveal what the effect of these treatments is to be. In the interval, one must bear in mind that the last generation was

almost equally enthusiastic in removing every detachable organ from the female pelvis to relieve these psychic conditions. Whether the infection idea is merely another of the many fads and fancies which have misled the profession and the public so many times in the past, the future will determine. For the present, we may rest assured that Dr. Cotton and his associates are giving us the opportunity to see the results of the treatment which Cotton has proposed, carried out on a large scale, with much enthusiasm and great thoroughness.

A. S. H.

The Legislator and Medical Practice

During the past decade there have been marked strides in the improvement of medical education throughout the United States due largely to a responsive medical profession to the stimulation and criticism of our medical institutions by the investigations and report of the committee of the Carnegie Foundation for Advancement of Teaching, after a thorough study of the situation.

The state of Minnesota through the medical department of our university, supported by a progressive medical profession and the co-operation of the State Board of Medical Examiners, has at all times occupied the vanguard in elevating and maintaining the highest medical standards.

Recent legislatures have made repeated attempts at legislative enactments inimical to the medical profession. To thwart these efforts each session of the legislature must be carefully scrutinized with a view to recognizing promptly efforts at legislation aimed to lower the standards of medical practice. In most instances these attempts are made indirectly, there being no overt measures to lower the requirements demanded of regular practitioners in medicine, but rather the establishment of lower educational requirements for those desirous of legalizing various cults now existing but not universally recognized.

The medical profession desires to elevate the standards of members and not to lower the entrance requirements. It stresses the importance of protecting the public by requiring equally high preliminary education and scientific preparation to practice the art of healing for all those who would treat the sick irrespective of the system of therapeutics they openly declare. Whether we admit or deny that the rights of the regular practitioner are

infringed upon by opening wide the doors to ignorant, untrained and unqualified practitioners, the injury to the profession is far less than that which results to the body politic.

Our regular school of medicine has labored incessantly for the elevation and maintenance of its own standards, not merely in the interests of professional standing, but in accord with the belief that the sick of a community are justly entitled to the highest type of skilled service founded upon a cultural foundation and scientific training.

To sanction dual educational qualifications is incongruous and has no justification; it outrages public welfare, regardless of the "isms" and "pathies" of definite belief. Not taking the element of therapeutics into consideration, it is undeniable that capacity for making diagnosis is a fundamental in the training of those who would apply themselves intelligently to the care of the sick. Any system of licensure which fails to take cognizance of diagnostic ability falls short of adequate provision for safety.

The confidence in regular practitioners of the art of healing is evidenced the world over. The progress in lessening morbidity and mortality, the enrichment of human life, the result of the earnest endeavors of physicians in all branches of medicine are adequately recognized and heralded except in legislative halls when a lobbying group lifts up its voice for political recognition. Under this influence the legislator little thinks of the triumph over disease and its control; his mind does not dwell upon the accomplishments of our hospitals, dispensaries and medico-social agencies, nor the excellent achievements of our Department of Health. It would seem that public health dwindles in importance when it comes to satisfying the demands of an alleged constituent with vote-getting possibilities.

How and why legislators can open upon the general public the doors of the various cults that are completely out of harmony with intelligent conception of etiology and pathology of disease, denying the existence of germ-borne disease; that repudiate every vestige of the achievements of physical and chemical science; that reject every doctrine of causation, save in their own obscure and indefinite concept as exemplified by the numerous legal definitions of chiropractic, is hard to conceive. It is almost ridiculous to believe that legis-

lators believe and accept these doctrines and are legislating because of their convictions that such methods will advance the public health.

What is the remedy? Medical lobbying to controvert the statements of those whose commercial interest seeks to dictate terms of licensure has been ineffective. However, the medical profession must not assume an air of armed neutrality. If our county societies and our state organization had the real courage of conviction, concerted action would make it impossible for such follies to be perpetrated by those legislators who are too weak to meet the lobbying tactics of any cultist group. Where are the large organizations who are constantly utilizing the services of physicians who consider themselves allies in fostering the welfare of the communities, such as our public health and various charitable organizations, unions and industrial institutions, life insurance companies, the lawyers who lean upon medical science for aid in arriving at the truth concerning accidents, compensation and the like? Of course, we can hardly criticize these allied interests when physicians themselves do not actually undertake an organized defense of the public interest. Physicians hesitate opposing legislation because it is such a simple matter to accuse them of self-interest.

Finally, the conscience of legislators must be aroused by publicity. They should be reminded that the respect for the health of a community is an obligation resting upon themselves equally with the physician; that they have responsibility as well as power, and should be guided and controlled by it. When voting for a proposed law that would lower the standards of medical practice, particularly for those who deny the existence of infection; the need of sanitation, etc., they should be compelled to give a reason for justifying their act. Instead of the medical profession being on the defensive in attacks upon our educational standards in this state, the legislator should have thrust upon himself the responsibility of defending his activities in behalf of those whose irregular principles antagonize human experience and established scientific judgment. The medical profession should openly challenge as a breach of good faith and political trust those legislators who through ignorance, bias or political ambition are willing to sacrifice the best interest of the constituents they have sworn to represent and protect.

G. B. W.

Medical Practice Bill

Progress has been made respecting Senate File No. 241 (known in the House as House File No. 294), which bill changes the Statute of Limitations so that malpractice suits must be brought within two years instead of six years as now.

This proposed act will limit the time within which such actions may be brought as against doctors, dentists, hospitals and sanatoriums. The present status of the bill would indicate that we have good reason to hope for its ultimate passage. The Judiciary Committee of the Senate has approved and recommended the bill. This is in itself a decided step in advance and a hopeful sign of ultimate success.

The proposed act, as amended in the Judiciary Committee of the Senate, permits the defendant to plead a counterclaim arising out of any negligence or malpractice out of which a cause of action might arise.

The proviso, or amendment, is in language as follows:

“. . . provided, a counterclaim may be pleaded as a defense to any cause of action arising under subdivision one of this section notwithstanding it is barred by the provisions of this chapter, if it was the property of the party pleading it at the time it became barred and was not barred at the time the claim sued on originated, but no judgment thereon except for costs can be rendered in favor of the party so pleading it.”

Our attorneys inform us that this proviso means that where a doctor sues a patient for services rendered, let us say for illustration in the sum of \$200.00, the defendant would be, under this amendment, permitted to counterclaim for malpractice (or other negligence), but unless the counterclaim is brought within two years, the defendant would be limited in his recovery thereunder to an amount not exceeding the doctor's claim. It would appear that this feature of the bill is not of great importance. We usually find that if a doctor's bill is not paid within two years its value is so problematical as to leave it of very little, if any, value.

Mr. Oppenheimer, the association attorney, who has looked over the above amendment, states that it is not necessary to raise any serious objection to this amendment, as a man has an inherent right to make counterclaim anyway, and this right cannot be legislated away from him, therefore this amend-

ment does not detract from the value of the bill and will not affect the constitutionality of the bill.

It is our hope that the bill will be promptly considered by the Senate and we confidently look for passage therein. Our difficulty with respect to the success of the act lies with the house. The Committee in the House may not be favorable to the proposed law. However, it is our intention to use our best efforts to bring about a favorable report. If we cannot do so, we at least hope to get a minority report, so that the merits of the bill may be fought out on the floor of the House.

The importance of this legislation is such that it behooves every member of the profession mentioned to work for its ultimate passage. Malpractice suits have increased more than 300 per cent within the last few years. Furthermore, larger verdicts are constantly appearing. A man's skill, ability, integrity and general reputation do not bar recovery in a malpractice suit. Not only the monetary cost to the doctor, but the mental worry, anxiety, loss of prestige, etc., far exceed the actual money loss. It is estimated that at least one-third of the suits brought for malpractice are begun after two years and the most of these are of the blackmailing or hold-up type, often being brought in where the doctor tries to collect a bill. At other times such actions are brought as late as within a day or two of the present six year period of limitations. The danger facing the profession under circumstances such as exist in the practice of every doctor and dentist (not overlooking or forgetting hospitals and sanatoriums) is very real. The proposed act should prove of inestimable value to the profession.

The present bill is the same that was presented to the Legislature four years ago and which was summarily killed in committee. The favorable course of the bill so far is due to the untiring efforts of our legislative committee and particularly its chairman, Dr. H. M. Johnson, of Dawson, who has been devoting all his time since January 10th to legislative affairs of the association.

The impression has been given elsewhere that passage of the bill in question is assured. This is an erroneous impression as the recommendation of the Judiciary Committee of the Senate was not announced until February 18th and at the present writing the Judiciary Committee of the House has not taken definite action. There should be no let-up in our efforts to bring to the attention of this House committee our ideas of the justice of the provisions

of this bill. Some members of the association have shown a lethargy when requested to co-operate with the legislative committee of the association. Prompt action in such matters is essential. The more the subject is investigated the more important the passage of this bill seems to be. As stated above, about one-third of the present malpractice suits are not instituted until after a two year period following the rendering of professional service. The present bill deserves the backing of every member of the association.

OBITUARY

DR. JOHN WILLIAMS

After several years' struggle against expected death from heart trouble, Dr. John Williams, of Lake Crystal, finally succumbed in Mankato, Friday afternoon, November 21, 1924. Dr. Williams was spending a few days visiting relatives in Mankato previous to his anticipated return to California, where he had gone for the past several years during the winter.

Dr. Williams was born at Machynlleth, Montgomery, North Wales, in 1856, being the son of the late Mr. and Mrs. Lewis Williams. His father was the relieving officer of the district and a very highly respected citizen of his home town. Dr. Williams began his medical studies when very young, under the well known Dr. Hugh Lloyd of Machynlleth, with whom he spent seven years.

In 1877 he came to America and located at Bangor, Wis. He took a course in Rush Medical college, Chicago, from which institution he graduated in 1880. August 25 of the same year he was married to Miss Sarah H. Hughes, the youngest daughter of the late Rev. John Hughes. Having practiced his profession at Bangor for four years, he moved to Cashton, Wis., and thence to Lake Crystal.

Two daughters were born to them, Una M., who died in 1891, and Edna A., who is married to Mr. Lee Piper of Minot, N. D.

Mrs. Piper is the only surviving member of the family, Mrs. Williams having preceded her husband in death on January 23, 1923. Mr. Williams also has surviving him a twin brother, D. D. Williams, residing in his native country of Wales.

A fitting tribute to Dr. Williams as a physician is taken from the columns of a home paper: "Dr. John Williams was a type of the old time physician who combined all the good characteristics of the older physicians with all the advanced skill of the later types. His presence in a sick room was an inspiration. His interest never ceased in patient and friend, and in hundreds of cases the satisfaction of healing the sick was his only desire for a reward. He enjoyed a large circle of acquaintance throughout this part of the state, including that of many eminent physicians and surgeons."

DR. GEORGE GOODRICH BALCOM

Dr. George G. Balcom, of Lake Wilson, died at his home Thursday, November 6, 1924, following a short illness.

Dr. Balcom was a pioneer physician in southern Minnesota. Born in Elmira, N. Y., on March 5, 1866. He spent his boyhood days in Grand Rapids, Michigan. After completing his high school course there he entered Hamline University and later the Medical College of the State University, from which he graduated in June, 1896, and located the same year in Avoca.

In 1897 he was united in marriage to Miss Rosa Levada Cornish, of Minneapolis. Dr. and Mrs. Balcom made their home in Slayton, where they resided until 1901. For twenty-three years Dr. Balcom and his family were residents of Lake Wilson, during which time the Doctor achieved a very extensive practice, winning his way into the hearts of thousands of people.

In his profession Doctor Balcom was held in great esteem. He was elected to places of honor and responsibility, being president of the State Homeopathic Society, vice president of Minnesota State Sanitary League, and until quite recently president of the Southern Minnesota Medical Society. He found extensive fields waiting for his accumulated knowledge and wide experience, consequently these organizations all prospered under his able leadership.

He leaves to mourn the loss of a loving husband and kind father, his bereaved wife and one daughter, Beatrice; his aged mother, who lives in Elmira, N. Y.; two brothers, Norman Balcom of South Bend, Washington, and Rutherford Balcom, of Detroit, Mich.; and one sister, Mrs. Lynn Woodberry, of St. John, Mich.

DR. JOHN ALEXANDER MONAHAN

John Alexander Monahan was born in New Brunswick, Canada, May 15, 1865. His father and mother came from Ireland and Scotland, respectively, and settled in New Brunswick, enduring the hardships of pioneer life there.

Dr. Monahan came to Minneapolis in 1887 and attended the College of Pharmacy of the University of Minnesota. After completing his course he studied medicine in Hamline University, from which he was graduated in 1902. After a year of internship in St. Joseph's Hospital, St. Paul, he took up the practice of medicine in Minneapolis, where he resided until his death. He was a member of the surgical staff of St. Barnabas' Hospital.

He was a member of the Hennepin County Medical Society, the State and American Medical Associations.

In 1891, Dr. Monahan was married to Miss Ella Jordan of Annandale, and there are two daughters, Ethel and Eva.

Dr. Monahan was a 32nd degree Mason and a Noble of Zurah Temple of the Mystic Shrine. He was also a member of the Benevolent and Protective Order of Elks, and of the Automobile Club of Minneapolis.

He died at his home in Minneapolis on Oct. 12, 1924, of heart disease.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

The annual meeting of the State Medical Association will be held at the University Medical School, Minneapolis, April 27, 28 and 29, 1925. Through the courtesy of the University authorities the use of the medical buildings has been offered to the Association.

The officers of the surgical section this year are Dr. Harry P. Ritchie, St. Paul, chairman, and Dr. O. J. Hagen, Moorhead, secretary. Those of the medical section are Dr. L. G. Rowntree, Rochester, chairman, and Dr. F. J. Hirschboeck, Duluth, secretary.

The Council of the Association will meet as usual on the morning of the first day (Monday) of the convention and the House of Delegates, the afternoon of the same day.

A tentative program for Monday evening has been arranged which will include addresses on subjects of practical value to members such as: Periodic Medical Examinations, Dr. Frank Billings; Medical Defense, Dr. W. C. Woodward, chairman of the Judiciary Committee of the American Medical Association; Don'ts for Malpractice, Mr. W. H. Oppenheimer.

Tuesday evening (April 28) is to be devoted to a banquet at which Dr. W. J. Mayo will preside as toastmaster. Dr. W. D. Haggard, Nashville, Tenn., president of the American Medical Association, will be the principal speaker and will address the members on "The American Medical Association and the Future of Medicine." Other invited guests are Dr. Frank Billings, Governor Theodore Christianson, President L. D. Coffman of the University of Minnesota and Mayor George E. Leach of Minneapolis.

On Wednesday evening a smoker and entertainment will be given the visiting physicians by the Hennepin County Medical Society and no efforts will be spared in making the evening most enjoyable.

The annual Minneapolis Clinic Week will be combined with the State Association meeting this year, and Thursday, April 30, will be devoted to clinics to be given by members of the Hennepin County Medical Society. Dr. W. A. Jones, Minneapolis, is chairman of the clinical section of the local society and will have charge of the clinics.

A tentative program of the scientific meetings follows:

TUESDAY MORNING, 8 o'Clock, April 28, 1925. Dr. Harry P. Ritchie, presiding.

Joint Session, Medical and Surgical Sections. The University Campus.

1. Clinic on Bone Tumors.

- (a) Clinical Presentation by Dr. H. W. Meyerding, Rochester, Minn.
- (b) Pathological Demonstration by Dr. W. C. MacCarty, Rochester, Minn.

2. Tumors of the Breast.

- (a) Clinical Demonstration, Dr. W. D. Haggard, Nashville, Tenn.
- (b) Pathological Demonstration, Dr. W. A. O'Brien, University of Minnesota, Minneapolis.

3. Tumors of the Lymph Glands.

- (a) Clinical Presentation, Medicine, Dr. S. Marx White, Minneapolis.
- (b) Surgical Demonstration, Dr. A. B. Colvin, St. Paul.
- (c) Roentgenologic and Radium Treatment, Dr. A. S. Fleming, Minneapolis.
- (d) Pathological Demonstration by Dr. E. T. Bell, University of Minnesota, Minneapolis.

WEDNESDAY MORNING, 8 o'Clock, April 29, 1925. Dr. L. G. Rowntree, presiding.

Joint Session, Medical and Surgical Sections. The University Campus.

1. Diseases of the Thyroid.

- (a) Clinical Demonstration, Dr. H. S. Plummer, Rochester, Minn.
- (b) Surgical Consideration, Dr. J. deJ. Pemberton, Rochester, Minn.

2. Diabetes Mellitus.

- (a) Clinical Demonstration, Dr. A. H. Beard, Minneapolis.
- (b) Surgery in the Diabetic, Dr. A. A. Law, Minneapolis.

3. Diseases of the Glands of Internal Secretion. Dr. H. L. Ulrich, Minneapolis.

4. Neurologic Clinic.

- (a) Nervous Disorders in Pernicious Anemia, Dr. A. S. Hamilton, Minneapolis.
- (b) Early Diagnosis of Tabes Dorsalis, Dr. J. C. McKinley, Minneapolis.
- (c) The Sequela of Encephalitis, Dr. E. M. Hammes, St. Paul.
- (d) Surgery in Spinal Cord Tumors, Dr. A. W. Adson, Rochester, Minn.
- (e) Clinic on Speech Defects, by Dr. Smiley Blanton, Minneapolis.

LITERARY PROGRAM

1. Phases of the Smallpox Epidemic; Lantern Slide Demonstration. Dr. S. E. Sweitzer, Minneapolis, Minnesota. Discussion, Dr. O. M. McDaniel, Minneapolis, Minnesota, and Dr. H. E. Michelsen, Minneapolis.
2. Causes of Death in the Fetus and Newborn; Based on 450 Necropsies. Dr. F. L. Adair, Minneapolis, Minnesota. Discussion, Dr. W. A. O'Brien, University of Minnesota.
3. Management of Toxemia Associated With Gastric Stasis, Obstructive and Non-obstructive, Dr. C. S. McVicar, Rochester, Minnesota. Discussion, Dr. Donald C. Balfour, Rochester, Minn.
4. Postoperative Pulmonary Complications, Dr. P. G. Boman, Duluth, Minnesota. Discussion, Dr. F. J. Hirschboeck, Duluth, Minnesota.
5. Effect of Environment Upon the Upper Respiratory Tract and Clinical Significance, Dr. H. I. Lillie, Rochester, Minnesota.

6. The Use of Novasurol as a Diuretic, Dr. Harry Oerting, St. Paul, Minnesota.
7. Congenital Syphilis and Its Treatment, Dr. E. F. Robb, Minneapolis, Minnesota. Discussion, Dr. C. O. Kohlbry, Duluth, Minnesota.
8. Discussion of the Care and Treatment of the Psycho-Neurotic, Dr. W. A. Jones, Minneapolis, Minnesota. Discussion, Dr. Arthur Sweeney, St. Paul, Minnesota, and Dr. Frederick Moersch, Rochester, Minnesota.
9. Psychology of Compensation Neurosis, Dr. Arthur Sweeney, St. Paul, Minnesota.

THE AMERICAN CONGRESS ON INTERNAL MEDICINE

The Ninth Annual Clinical Session of the American Congress on Internal Medicine will be held in Washington, D. C., March 9-14, 1925.

Washington clinicians and investigators of attainment will devote the entire session to amphitheatre and group clinics, ward "rounds," laboratory conferences, lectures, demonstrations of special apparatus and methods, and the exhibition of unusual scientific collections. Civilian and governmental services are united in the aim to make the week useful and memorable.

Practitioners and laboratory workers interested in the progress of scientific, clinical and research medicine are invited to take advantage of the opportunities afforded by this session.

Inquiries should be addressed to the Secretary-General, Frank Smithies, 1002 North Dearborn Street, Chicago, Ill.

WABASHA COUNTY MEDICAL SOCIETY

Pursuant to instructions issued at the annual meeting of the Wabasha County Medical Society, held July 10, 1924, the following committee, Drs. H. E. Bowers, E. A. French and W. F. Wilson, interviewed the Board of County Commissioners at their first meeting in January and secured from them the following resolution:

"Resolved, that for the year 1925 no district physician shall be appointed, but in lieu thereof the following plan shall maintain: whenever anyone is in need of medical or surgical aid or attention and unable to furnish it himself, by reason of his poverty, any duly licensed physician and surgeon of the County of Wabasha may attend such individual, but before doing so, shall report the case to the County Commissioner of the district, and receive permission from the County Commissioner of that district. Each physician and surgeon shall present a bill with an itemized statement thereof duly sworn to the County Board monthly, and before the same shall be allowed it shall be approved by the commissioner of the district."

The committee asked the commissioners to pay regular rates for this county work, and it seemed to be the sense of the board to pay the fees according to the fee schedule of the County Medical Society. This new plan was approved essentially as formulated and is believed to be a great improvement over the former contract system.

OF GENERAL INTEREST

On November 5, 1924, a son, Antony Mills Diehl, was born to Dr. and Mrs. Harold S. Diehl of Minneapolis.

Dr. M. S. Nelson recently moved from Spring Grove to Granite Falls, Minnesota, where he has opened a hospital.

Dr. T. M. Joyce of Janesville has moved to the state of Washington, where he has taken up work in a Veterans Bureau Hospital.

Dr. F. J. von Bohland of Belle Plaine has been in California since the first of the year, where he went for the benefit of his health.

Dr. Robert Emmett Farr, Minneapolis, gave the McArthur Fellowship address before the Chicago Institute of Medicine, February 27th.

Dr. Ralph L. Kirsch, formerly of the Mayo Clinic, Rochester, is now associated in practice with Dr. J. B. Keaster, Lamanda Park, California.

"Pyelitis in Pregnancy" was the subject of a paper presented by Dr. F. J. Souba before the February meeting of the Fairview Hospital staff, Minneapolis.

Announcement is made of the marriage of Miss Josephine Kenyon, daughter of Dr. and Mrs. Paul Kenyon, to Philip Douglas Butturff at Wadena on Monday, February 2.

Dr. Gustav Schwyzer, Minneapolis, gave a demonstration of goiter cases before the noonday meeting of the Hennepin County Medical Society, Wednesday, February 11. Dr. Arnold Schwyzer, St. Paul, led the discussion.

Dr. Ann Whelan, Minneapolis, has recently been appointed temporary assistant in obstetrics and gynecology and Dr. Lyman R. Critchfield, St. Paul, assistant in pediatrics at the University of Minnesota Medical School.

At the annual meeting of the Waseca County Medical Society early in January the following officers were elected for the ensuing year: President, Dr. H. A. Miller; vice president, Dr. H. M. McIntire; secretary-treasurer, Dr. B. J. Gallagher.

At the regular February meeting of the staff of the Swedish Hospital, Minneapolis, Dr. Joseph Prim read a paper on "A Few Notations on Diabetes and Insulin." Dr. A. E. Johnson presented the subject "Surgical Complications of Diabetes."

Dr. Joseph D. Lewis, formerly surgeon in chief of the department of eye, ear, nose and throat diseases at the Minneapolis General Hospital, has announced the removal of his offices to Suite 421, San Marcos Building, Santa Barbara, California.

Dr. William P. Shepard, for three years assistant director of the Students' Health Service of the University of Minnesota, resigned his position on January 1 to become Commissioner of Health and Director of Hygiene of the schools of Berkeley, California.

In the list of honor graduates of the Army Medical School at the Graduation Exercises Tuesday, February 10, at Washington, D. C., is the name of First Lieut. Arthur D. Hawkins. Dr. Hawkins graduated from the University of Minnesota Medical School in 1919.

Dr. Russell M. Wilder, Rochester, Minn., gave the annual address before the Minnesota Pathological Society at their meeting Tuesday night, February 17, at the Institute

of Anatomy, University of Minnesota. His subject was "Studies in the Metabolism of Diabetes."

Dr. Harry D. Lees has been appointed assistant director of the Students' Health Service of the University of Minnesota. For ten years Dr. Lees was engaged in the practice of medicine at Esmond, N. D., and last year was resident physician at Parkview Hospital, Minneapolis.

The Council on Medical Education and Hospitals of the American Medical Association will hold its annual meeting March 9, 1925, in the Gold Room of the Congress Hotel in Chicago. Physicians interested are invited to attend.

It has been announced that the recently completed hospital at Eveleth, Minnesota, for the treatment of trachoma patients has been designated as the place to which all persons in Minnesota suffering from trachoma can be sent. The new hospital has been particularly equipped for the purpose.

In conformity with the recommendation of the House of Delegates of the State Association addresses by association members are being broadcast by Station WCCO each week. The addresses are being published in the country edition of the St. Paul Dispatch, which has a circulation of 280,000.

St. Mary's Hospital extended a very delightful staff dinner to its staff members and the medical profession on the evening of February 5, 1925. Eighty-eight doctors were in attendance at the dinner and remained for the staff meeting afterwards. Dr. F. W. Briggs read his staff thesis, and Dr. Gordon St. Clair gave a report on his recent studies on "Lues of the Central Nervous System."

At the December meeting of the Administrative Board of the Medical School, University of Minnesota, the following nominations were approved and recommended: Dr. Alexander Venables as Teaching Fellow in Ophthalmology; J. A. Evert, as Instructor in Physical Therapy; Dr. F. E. B. Foley as Instructor in Urology; Drs. V. P. Hauser and W. Ogden as Assistants in Surgery; Dr. J. F. Fulton as Emeritus Professor in Ophthalmology.

Dr. Kenneth H. Sutherland, who was a member of the staff of the Students' Health Service of the University during the year 1923-24, has been appointed county health officer of San Luis Obispo County, California. From July to December, 1924, he was engaged in public health work in the state of Alabama under the International Health Board of the Rockefeller Foundation. Before leaving to take up his work in California he was married to Miss Elizabeth Moody of Minneapolis.

The annual meeting of the Swedish Hospital Association will be held on Tuesday, March 3, 1925, at 8:00 P. M., in the Assembly Room of the hospital.

The President of the Board of Trustees and the Superintendent of the hospital will report on the work of the hospital for the year 1924.

Four trustees are to be elected for a term of three years. Those whose terms then expire are: Aaron Carlson, E. G. Dahl, Dr. Julius Johnson and John Nodell.

The new Wesley Hospital was opened in Wadena, January 30. This hospital is operated under the Board of Hospitals and Homes of the Methodist Episcopal Church. It is of brick, fireproof construction, modern in every re-

spect with a present capacity of thirty-five beds. If occasion requires, the capacity can be increased to fifty beds. The hospital is open to all regular licensed physicians in the territory it serves. It is the intention to open a training school for nurses at the hospital in the near future.

Three Duluth physicians, Drs. R. S. Forbes, J. R. Manley and J. E. Power, will leave shortly, with their families, for from three to six months' special study in Europe. Dr. Power expects to devote his time to a study of eye, ear, nose and throat; Dr. Forbes to gynecology and obstetrics; Dr. Manley to gynecology and obstetrics. All of these men expect to follow the precedent set by many other Minnesota physicians, and intend to do their preliminary work in Vienna. The men interested in gynecology and obstetrics expect to visit Dublin.

The following resolution of the Minnesota State Medical Association adopted at the St. Cloud meeting last October was approved by the Administrative Board of the Medical School, University of Minnesota, January 12, and was referred to the Dean for consultation with the President:

"That the Secretary of the Minnesota State Medical Association transmit to the Board of Regents of the University of Minnesota the recommendation of their House of Delegates that in addition to educational requirements of the Medical School, the character of applicants for admission be ascertained by confidential reports and that those not measuring up to a proper standard be rejected."

The work of the Canadian Social Hygiene Council in conserving health and influencing longevity has received a high tribute recently. The Metropolitan Life Insurance Company of New York has made a grant of fifteen thousand dollars to aid in extending throughout Canada its child welfare and educational activities.

This company has long been famous for its generous support of such movements as may offer definite means of prolonging human life. It is today spending several millions annually in public health work in Canada and the United States. It has aided anti-tubercular work. It supports scientific programs of child welfare, and it is now stepping forward to fight against venereal diseases.

The Union Hospital, New Ulm, Minnesota, has recently effected an organization under the direction of the following officers: President, Dr. L. A. Frisch; vice president, Dr. O. C. Strickler; secretary, Dr. G. F. Reinecke; treasurer, Dr. George B. Weiser. The Executive Committee includes Dr. Theo. F. Hammermeister. Dr. J. H. Vogel and Dr. F. H. Dubbe. Dr. George F. Reinecke and Dr. A. L. Russke are in charge of the Eye, Ear, Nose and Throat department; Dr. Ross is the pathologist and bacteriologist. The superintendent, Miss Ida Stolt, has established a training school for nurses in connection with the hospital.

A gift of \$250,000 to Indiana university by Mr. and Mrs. William H. Coleman, of Indianapolis, for a women's hospital to be used principally for lying-in patients, has been announced by officials of the university. The new hospital will be located on the medical school campus at Indianapolis and will become a training unit of the school of medicine. This new gift from Mr. and Mrs. Coleman is in addition to one of \$75,000 contributed by them last June to the school of medicine of the state university for

the endowment of three chairs—ophthalmology under the direction of Dr. F. A. Morrison, surgery directed by Dr. John H. Oliver, and gynecology under Dr. O. G. Pfaff. The medical and hospital gifts are in the form of a memorial to Mrs. Suetta Coleman Atkins, daughter of Mr. and Mrs. Coleman.

The Friends of Medical Progress, a national lay organization incorporated in Boston, Massachusetts, in 1923, for the purpose of disseminating medical knowledge among the general public, is contemplating for the year 1925 a greatly extended program of service. Office headquarters, formerly located in Boston, have moved to New York City, 370 Seventh Avenue, where co-operation with the more important educational and health organizations will be facilitated. With the change in location also comes a change in name. The society will hereafter be called the American Association for Medical Progress. Mr. Benjamin C. Gruenberg, well known to workers in the fields of education and public health, will take over the active management of the organization. In the past year approximately 72,000 publications dealing with various phases of animal experimentation, vaccination, etc., have been distributed. An increasing number of similar publications is planned for the current year. A lecture program will be developed and attention will be focused on the formation of branch organizations throughout the country.

Ground has been officially broken and actual construction begun on New York's new Medical Center, which is being developed under the direction of the Joint Administrative Board of Columbia University and Presbyterian Hospital. At the exercises held Saturday, January 31, on the twenty-two acre plot at 168th Street and Broadway before a notable gathering of representative persons of the metropolitan district, including many of the profession, Mr. Edward S. Harkness, the first Chairman of the Joint Administrative Board, turned the initial spade of earth. This act signalled the starting of the construction of the first and largest unit of the Center, the combined new Columbia University School of Medicine and Presbyterian Hospital—a Ten Million Dollar structure. With the present units being built will be assembled a School of Nursing, a maternity hospital, a children's hospital, an eye hospital, an ear, nose and throat hospital, an orthopedic hospital, a urological unit, a dermatological hospital, a School of Dentistry, and such other institutions of patient care, teaching and research as are needed to fully complete the Center. Another important unit of this medical center will be a State Psychiatric Institute and hospital for the study of the prevention and care of mental diseases.

The new St. Luke's Hospital, Duluth, opened its doors to the public January 31, and to its patients February 2, 1925. This fine, modern hospital has begun in November, 1922, and now, when finished, has one hundred private room capacity, in addition to the old building, which is to be arranged with ward provision, space for interns, outpatients, etc. Schmidt, Gardner and Martin, Chicago architects, planned the structure, and German and Jenssen, of Duluth, were the local associates. On the opening of the hospital fully twenty thousand people went through and saw the numerous novel features, as well as the fine, substantial construction, on the two opening days.

St. Mary's Hospital, Duluth, has just opened up a splen-

did new suite of operating rooms, made over at a cost of approximately \$37,000. These rooms include a splendid central sterilization room, in addition to special provision for the surgeons with lockers, shower baths and various other comforts. Each operating room is fitted with its own individual instrument sterilization equipment. Special provision is made in the corridors for instrument cases, storage, and easily available space for accommodating dressing packages and usual operating room equipment.

With these two fine, well equipped hospitals, Duluth now has well over five hundred hospital beds in its downtown area alone.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

BENZOL PRODUCTS Co.:

Cinchophen-B.P.C.

HYNISON, WESTCOTT & DUNNING:

Antimony Sodium Thioglycollate

Antimony Thioglycollamide

ELI LILLY & Co.:

Iletin (Insulin-Lilly) U-10, 10 c.c.

Iletin (Insulin-Lilly) U-20, 10 c.c.

Iletin (Insulin-Lilly) U-40, 10 c.c.

H. K. MULFORD Co.:

Ampules Solution Pituitary Extract-Mulford, 0.5 c.c.

Iodo-Casein with Chocolate

PARKE, DAVIS & Co.:

Iron Citrate Green

Ampules Iron Citrate Green-P. D. & Co. $\frac{1}{4}$ grain

Ampules Iron Citrate Green-P. D. & Co. $\frac{3}{4}$ grain

Ampules Iron Citrate Green-P. D. & Co. $1\frac{1}{2}$ grain

Mercurettes

Proposote

Proposote Capsules 5 minims

Proposote Capsules 10 minims

POWERS-WEIGHTMAN-ROSENGARTEN Co.:

Tryparsamide

PURE GLUTEN FOOD Co.:

Hoyt's Protein Cereal

SHARP & DOHME:

Tincture Digitalis Purified (Fat Free)-S. and D.

STANDARD CHEMICAL Co.:

Standard Radium Solution for Intravenous Injection,
5 micrograms Ra

Standard Radium Solution for Intravenous Injection,
10 micrograms Ra

Standard Radium Solution for Intravenous Injection,
25 micrograms Ra

Diphtheria Toxin Antitoxin Mixture 0.1 L + (Gilliland).

—A diphtheria toxin antitoxin mixture (see New and Non-official Remedies, 1924, p. 299), each c.c. of which represents 0.1 L + dose of diphtheria toxin neutralized with the required amount of diphtheria antitoxin. Marketed in packages of three 1 c.c. ampules; in packages of thirty 1 c.c. ampules; in packages of three 1 c.c. syringes; and in ampules containing respectively 10 c.c., 20 c.c., and 30 c.c. Gilliland Laboratories, Ambler, Pa.

Mallinckrodt Tetrabromphenolphthalein Sodium Salt.—A brand of tetrabromphenolphthalein sodium-N. N. R. For a discussion of the properties, actions, uses and dosage, see Jour. A. M. A., Dec. 2, 1924, p. 2095. Mallinckrodt tetrabromphenolphthalein sodium salt is supplied in 5 gm. ampules. Mallinckrodt Chemical Works, St. Louis. (Jour. A. M. A., Jan. 3, 1925, p. 37.)

Bacillus Bulgaricus-Squibb.—A culture of *Bacillus bulgaricus*, marketed in tubes, each containing 12 c.c. *Bacillus bulgaricus*-Squibb, is designed for internal administration and for direct application to body cavities, abscesses and wounds. See "Lactic Acid-Producing Organisms and Preparations." New and Non-official Remedies, 1924, p. 169. E. R. Squibb and Sons, New York.

Neorobin.—A product obtained by the reduction of chrysarobin. The actions and uses of Neorobin are the same as those of chrysarobin. It is claimed that neorobin is somewhat more active than chrysarobin and that its staining qualities are less than those of chrysarobin. Like chrysarobin, neorobin is used in the treatment of skin diseases, especially in psoriasis. It is used in the form of ointments which must be freshly prepared. Neorobin is marketed in vacuum sealed tubes containing 1 and 5 grains, respectively. H. K. Mulford Co., Philadelphia.

Intracutaneous Tuberculin for the Mantoux Test.—A preparation of Tuberculin-Koch (New and Non-official Remedies, 1924, p. 309), marketed in packages of one vial containing 0.0001 gm. tuberculin "O. T." accompanied by a vial containing physiological solution of sodium chloride sufficient to make 1 c.c. Lederle Antitoxin Laboratories, New York. (Jour. A. M. A., Jan. 10, 1925, p. 119.)

Tablets Benzyl Fumarate-Abbott, 5 grains.—Each tablet contains 5 grains of benzyl fumarate-Abbott. The Abbott Laboratories, Chicago. (Jour. A. M. A., July 24, 1924, p. 41.)

Ampules Solution Pituitary Extract-Mulford, 0.5 c.c.—Each ampule contains 0.5 c.c. of pituitary solution-Mulford (New and Non-official Remedies, 1924, p. 229). H. K. Mulford Co., Philadelphia. (Jour. A. M. A., Jan. 17, p. 203.)

Ovarian Substance-L. and F. Desiccated.—The entire fresh ovary of the hog, freed of extraneous matter, dried and powdered without the addition of diluent or preservative. For a discussion of the actions and uses of ovary preparations, see New and Non-official Remedies, 1924, p. 220. The product is marketed in 2 and 5 grain capsules and in 2 and 5 grain tablets. Lehn and Fink, Inc., New York.

Ovarian Residue-L. and F. Desiccated.—The residue from the fresh ovary of the hog, after removal of the corpus luteum, dried and powdered without the addition of preservative or diluent. For discussion of the actions and uses of ovary preparations, see New and Non-official Remedies, 1924, p. 220. The product is marketed in the form of 5 grain capsules and 2 and 5 grain tablets. Lehn and Fink, Inc., New York.

Corpus Luteum-L. and F. Desiccated.—The fresh substance of the corporea lutea of the hog, dried and powdered without the addition of diluent or preservative. For a discussion of the actions and uses of ovary preparations, see New and Non-official Remedies, 1924, p. 220. The product is marketed in the form of 2 and 5 grain capsules and 2 and 5 grain tablets. Lehn and Fink, Inc., New York.

Proposote.—A condensation product of creosote and phenylpropionic acid. It contains the equivalent of 50 per cent of creosote. Proposote is not decomposed by the gastric fluids and passes the stomach practically unabsorbed. It is decomposed in the intestine and its components are chiefly eliminated through the kidneys, but it is claimed that a part of the liberated creosote is eliminated through the respiratory tract. Based on this latter elimination, the administration of proposote is claimed to be of value in bronchitis and coughs due to bronchial infections. Proposote is used for the same purposes for which creosote is administered. It is marketed in the form of capsules containing 5 and 10 minims, respectively. Parke, Davis & Co., Detroit.

Standard Radium Solution for Intravenous Injection, 5 micrograms Ra.—Each ampule contains radium chloride-Standard Chemical Co. (New and Non-official Remedies, 1924, p. 277) equivalent to 5 micrograms of radium element in physiological solution of sodium chloride, 2 c.c. Radium Chemical Co., Pittsburgh.

Standard Radium Solution for Intravenous Injection, 10 micrograms Ra.—Each ampule contains radium chloride-Standard Chemical Co. (New and Non-official Remedies, 1924, p. 277) equivalent to 10 micrograms of radium element in physiological solution of sodium chloride, 2 c.c. Radium Chemical Co., Pittsburgh.

Standard Radium Solution for Intravenous Injection, 25 micrograms Ra.—Each ampule contains radium chloride-Standard Chemical Co. (New and Non-official Remedies, 1924, p. 277) equivalent to 25 micrograms of radium element in physiological solution of sodium chloride, 2 c.c. Radium Chemical Co., Pittsburgh.

Iletin (Insulin-Lilly) U-10, 10 c.c.—Each c.c. contains 10 units of iletin (insulin-Lilly) (New and Non-official Remedies, 1924, p. 152). Eli Lilly and Co., Indianapolis, Ind.

Iletin (Insulin-Lilly) U-20, 10 c.c.—Each c.c. contains 20 units of iletin (insulin-Lilly) (New and Non-official Remedies, 1924, p. 152). Eli Lilly and Co., Indianapolis, Ind.

Iletin (Insulin-Lilly) U-40, 10 c.c.—Each c.c. contains 40 units of iletin (insulin-Lilly) (New and Non-official Remedies, 1924, p. 152). Eli Lilly and Co., Indianapolis, Ind.

Tincture Digitalis Purified (Fat Free)-S. and D.—A fat-free tincture of digitalis corresponding in strength to tincture of digitalis-U. S. P., containing 45 per cent of alcohol. It is standardized by the one-hour frog method of the U. S. Pharmacopoeia. The actions, uses and dosage are the same as that of tincture of digitalis U. S. P. Tincture digitalis purified (fat-free)-S. and D. was introduced at a time when the "fat" of digitalis was believed to cause gastric disturbances. At present this claim of superiority is not tenable and the preparation is sold simply as a standardized tincture of digitalis. Sharp and Dohme, Baltimore. (Jour. A. M. A., Jan. 24, 1925, p. 285.)

Antimony Sodium Thioglycollate.—A compound formed by dissolving antimony trioxide in a solution of a mixture of sodium thioglycollate and thioglycollic acid. It contains not less than 37 per cent of antimony. The actions and uses of antimony sodium thioglycollate are the same as those of antimony thioglycollamide, but it is more soluble and in higher doses appears to be less toxic. Hynson, Westcott and Dunning, Baltimore. (Jour. A. M. A., Jan. 31, 1925, p. 369.)

CASE REPORTS

CASE OF BILATERAL DERMOID CYSTS OF THE OVARIES

PERRY E. DUNCAN, M.D.
St. Paul

Mrs. F. W., a white, married woman, aged 18 years, was admitted to St. Luke's Hospital, November 1, 1924—a private case of Dr. L. M. Benepe. Her chief complaint was pain in the lower part of the left abdomen. There was nothing of importance in her family or past history. Her menstrual history was normal before the present illness.

Four months previous to admission, an abortion was performed. At this time she was told that she was three months pregnant, having missed the three previous periods. Since then she had complained of a dull pain in the left iliac quadrant, having been partially incapacitated for work during this period.

The physical examination was essentially negative except for the presence of a firm, rounded, smooth mass, movable, and about 10 cm. in diameter, situated in the left iliac fossa and to the side of the uterus. The uterus was essentially normal. The right ovary was in its usual position and seemed to be about twice the normal size. The preoperative diagnosis was hydrosalpinx.

At operation, November 7, 1924, the left ovary was represented by a tumor mass lying in the left iliac fossa. The right ovary also contained a yellowish cyst, through the wall of which some hair could be seen. The right and left tubes and left ovary were removed in the usual manner. The right-sided cyst was resected, leaving about what would correspond to one-eighth of a normal ovary.

Pathological Examination.—The tumor mass on the left measured 12x10x8 cm. It was smooth, glistening and of a reddish color and a fine tracery of blood vessels were seen over its surface. It was doughy in consistency and on section presented the appearance of an ordinary dermoid filled with hair, bone and sebaceous material.

The resected portion of the right ovary measured 6x4x3 cm. It was smooth, pale gray and glistening. On section, a cystic structure filled with sebaceous material and hair.

Areas from the tumor removed from the right ovary were lined with a stratified squamous epithelium. Numerous hair follicles were present. The yellow cystic areas seen on the gross were small cavities lined with stratified epithelium. Sections from the large cyst on the left showed a similar inner epidermal lining without papillæ, but with many hair follicles and sebaceous glands.

Comment.—This patient passed through an uncomplicated convalescence. The case affords a good illustration of the feasibility of conserving the ovarian substance when some normal tissue is present, thereby avoiding the danger and inconvenience of a premature operative menopause. The case also emphasizes the fact that the mistake in diagnosis would likely have been avoided if a competent radiographer had been called to assist in making the diagnosis. However, the treatment and results would have been the same.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH

THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

SOME OBSERVATIONS ON GASTRIC CARCINOMA:
Martin B. Rehfuß (Medical Clinics of North America, November, 1924). The author submits the following data as the result of his observations.

The roentgenologic examination should include a careful fluoroscopic study not only of the antero-posterior position but the lateral one as well, so as to disclose lesions on the anterior or posterior wall.

An examination in the recumbent position is necessary in all doubtful cases to reveal lesions in the cardia, as well as to more perfectly visualize the pylorus.

In 95 per cent of cases the lesion gives roentgenologic evidence of its presence.

A negative defect in the stomach is always suspicious, even though it has the typical appearance of a healed ulcer.

Carcinoma of the stomach should be treated like an acute lesion, but with the demonstration of every gastric defect a routine Wassermann should be made.

From the standpoint of gastric chemistry Rehfuß suggests an examination of the fasting residuum for retention, microretention, pus, blood and organic acids. This is followed by a simplified test meal, preferably the Ewald meal, which will reveal pathologic exudates. He believes there is a tendency to generally lowered acid output up to total achlorhydria, increased soluble proteins, the presence of organic acids, a tendency toward the reduction of free hydrochloric acid and increased combined acidities, the presence of an increase in total and combined chlorides and the demonstration of pus and blood throughout the digestive period. In the majority of cases of malignant ulcer the hydrochloric acid reaches a high level. Two methods of analysis—chemical and roentgenologic—should be correlated, since they answer totally different questions; the x-ray, as to form, position, mobility and alterations in contour; the gastric analysis, through alterations in the gastric work and the evidence of exfoliation or exudation of pathologic products from the diseased area.

DR. F. J. HIRSCHBOECK.

A STUDY OF READMISSION AND RELAPSE OF TUBERCULOSIS IN 200 CASES OF EX-SERVICE MEN READMITTED TO THE NOVA SCOTIA SANATORIUM: A. F. Miller (American Review of Tuberculosis, 1924, ix, 561). During and since the war 1,338 ex-service patients were admitted to the Nova Scotia Sanatorium and 430 have been readmitted, many of them several times. This has afforded an unusual opportunity for following up the post-discharge history of military patients. In the present study of 200 readmissions 33 per cent had definite relapses while 67 per cent had no relapse. Some of those readmitted without evident relapse (39) were kept at the sanatorium only for a 2 weeks period of observation.

Study of the histories of the readmission cases proved interesting from two points of view: the medical and the economic. The symptoms were somewhat misleading inasmuch as many of them formerly considered as indicative or suggestive of tuberculosis are now known to be found in non-tuberculous or well-arrested cases. Eighty-nine per cent had cough, 84.5 per cent had expectoration, 84.5 per cent had pains in chest and 84.5 loss of weight and strength while 44 per cent had rise of temperature and 19.5 hemoptysis.

Dr. Miller believes that the presence and persistence of symptoms not accounted for by any medical findings may be due to a form of war neurosis. As was to be expected the incidence of relapse was lowest in the minimal and greatest in the far advanced group.

Twenty-seven per cent of the relapses were attributed to intercurrent respiratory disease, not including those in which "colds" were indirectly causative. A large percentage of the relapses were attributed to "unsuitable work."

According to Dr. Miller the question of support is the outstanding consideration in a study of readmission and relapse. If we had at the sanatorium some means for getting the patient to make his attempt at economic re-establishment in life, he could be kept there longer and be put more firmly on his feet before being sent out.

In conclusion Dr. Miller recommends as solution of the problem of relapse the industrial colony as carried on at the Papworth Estate in England. Here the hospital, the sanatorium, the training colony and the permanent settlement are parts of one excellent system for the care of the tuberculous.

A. T. LAIRD.

OCCUPATIONAL THERAPY IN THE SANATORIUM TREATMENT OF THE TUBERCULOUS: G. L. Bellis, M.D. (Archives of Occupational Therapy, 1924, iii, 363). Sanatoria are built and maintained for the purpose of giving to the tuberculous sick: first, the best possible opportunity for recovery; second, to teach the principles and practice of personal hygiene and sanitation; and third, to return to the community, if at all possible, a self- and perhaps a family-supporting citizen.

Thus the element of time is a most important factor in considering the welfare of all persons ill with tuberculosis.

From a meager beginning in 1915 by introducing the most simple arts and crafts work during medically prescribed exercise periods, the occupational therapy depart-

ment at Muirdale Sanatorium now includes bedside instruction, shop work in the more advanced as well as the simple arts and crafts, kindergarten and graded school work for children, academic training for convalescing adults, and supervised recreation.

What have been its advantages to the patient and to the institution? Eight years at Muirdale have demonstrated that occupational therapy:

(a) Promotes recovery from tuberculosis by substituting directed and supervised physical activities for the undirected and unsupervised physical activities destructive of the benefits to be gained through sanatorium treatment.

(b) Promotes recovery from tuberculosis by substituting the normal mental activities of an industrious life for the abnormal mental activities of idle life, a pathogenic psychosis extremely common to all individuals sick or well deprived of useful occupation.

(c) Enables the child undergoing treatment to continue school work under the most hygienic conditions possible, thus gaining in mind as well as in body, and enables the convalescent adult to become educationally better qualified to "carry on" in his former vocation or to take up a line of work entirely new and more adaptable to his requirements.

(d) Increases the length of stay of patients at the sanatorium by adding to sanatorium life an interest that is extremely attractive and relieves to a considerable extent the monotony of cure-taking.

(e) Simplifies the problems of administration especially in the matter of discipline and promotes in no small degree a most wholesome institutional atmosphere.

A. T. LAIRD.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

FRACTURES OF SHAFT OF THE FEMUR: Campbell and Spud (Surgery, Gynecology and Obstetrics, November, 1924). The condition of fracture of the femur is one of the most serious problems the surgeon has to face and is high in the ranks of permanently disabling injuries.

The two best methods in use for treatment of the condition is gradual reduction by suspension and traction in connection with the Balkan frame, and immediate reduction and plaster cast. When properly used the cast is the most reliable method of fixation at our command.

The authors base their statements on treatment of one hundred and fifty-three cases of fracture of the shaft of the femur, together with personal observation and careful study of reported results in literature.

Fractures should be reduced as early as possible, as ill-placed callus interferes with reduction, swelling is pre-

vented, and no callus is wasted. Callus once broken up never forms as rapidly again, and repeated reductions and disturbances of callus are one of the most common causes of non-union. The middle third of the femur is the most common site for a fracture. The fracture is usually transverse or spiral. The deformity usually seen is for the shorter upper fragment to be displaced forward and slightly abducted, due to the pull of the psoas, iliacus, pectineus and abductors of the thigh. Interposition of muscles or fascial bands between fragments is a very rare cause for failure of reduction or non-union. The most common cause for non-union in simple fractures is lack of reduction.

One of the greatest objections to the plaster cast is that the knee and ankle joints are necessarily immobilized for a long period of time, therefore causing some atrophy of articular cartilages and contractures of soft parts about the joints, resulting in a certain amount of stiffness in all cases. About five per cent of the cases reported had some permanent loss of motion, and in a few it was sufficient to seriously impair the joint.

In reducing fractures of the femur an orthopedic table with the usual attachments for extension and countertraction is essential. Combined with this should be an x-ray equipment. The patient is given a general anesthetic, the fracture reduced, and the position checked by the x-ray and fixed. A plaster cast is applied, extending from the upper chest to the toes and affected side, and to the knee on the unaffected side. The cast is removed at the end of two weeks in children and three weeks in adults, the alignment of the leg carefully inspected, the position of the fragments checked by x-ray, and the joints gently manipulated. A second spica cast is then applied, usually only taking in the injured limb if there is satisfactory union and good position.

Open reductions are rarely indicated in acute fractures of the femur. Early reduction and application of cast is the method of choice unless there is excessive swelling when the case is first seen. If such be the condition, manipulation is delayed until swelling recedes. Compound fractures with infection are frequently followed by non-union, particularly where there is loss of bone. A compound fracture is therefore kept in extension splint until all chances of infection have subsided. If no infection has occurred at the end of ten days, the fracture is reduced in the usual manner and the cast is applied. If infection occurs, adequate drainage is established.

The immediate reduction and application of a cast is an ideal method of treatment in children because of the uniformly good results, the ease of handling and caring for the patients, and the certainty that the fragments cannot displace due to lack of co-operation. Immobility of joints over a long period of time is not a factor of serious importance in children. The authors find that the plaster method properly used gives as good or better results in adults than any other method. Autogenous bone grafts are the best method of internal fixation in connection with open reduction. Internal fixation is rarely indicated in children even in non-unions. It is indicated in mal-unions in adults when reduction is difficult to maintain and always indicated in non-unions in adults.

J. W. STINSON, M.D.

ACUTE APPENDICITIS IN THE INFANT: Fenwick Beckman, M.D. (*Annals Surgery*, 1924, lxxx, 911-914). The author reports forty-three cases of acute appendicitis in children under five years of age, seen at the Bellevue Hospital, New York, up to 1916. This condition is rare and seldom occurs before the third year. Among the cases reviewed the youngest was twenty months. Ten of the patients were in their third year, nine in their fourth year, and twenty-three in the fifth year. Twenty-seven were males and sixteen females.

The mortality was 25.6 per cent, which is high in comparison with that in children of all ages (7.58 per cent in author's series). It proved 100 per cent in the second year, 60 per cent in the third, 22.2 per cent in the fourth, and 8.6 per cent in the fifth. Of the patients operated within twenty-four hours of onset of appendicitis, three had no perforation, twelve had localized abscesses, and were operated on an average of four days after onset of symptoms. Twenty-three had diffuse peritonitis with a period of three days elapsing before operation. There were ten deaths. Perforation tends to occur early in infants, and a high mortality follows spreading peritonitis. Of the ten who died of spreading peritonitis six had received castor oil, and two had been given frequent enemata.

Among the outstanding symptoms were noted vomiting (seen in 36 of 43 cases), pain, apathy, and prostration. Constipation usually occurs, but at times diarrhea is present. Abdominal respiration is unusual when peritoneal inflammation arises. At times abdominal rigidity is absent; however, it is present when there is peritonitis. Rectal examination is frequently valuable. Temperature of over 102.5 is seldom seen, although fever is usually present. Leukocytosis is usual.

The author concludes that acute appendicitis is rare in infants and is seldom seen before the second year of life. Mortality is relatively high due to the high percentage of early perforations and spreading peritonitis. Cathartics apparently precipitate perforation in many cases.

JACKSON K. HOLLOWAY, M.D.

COEXISTING NEPHROLITHIASIS AND URETEROLITHIASIS ON OPPOSITE SIDES: W. Frank Fowler (*Ann. of Surg.*). In this paper the author cites a case in which this comparatively rare condition of nephrolithiasis and opposite side ureterolithiasis was found, and outlines means of diagnosis and treatment.

Braasch's findings were quoted in which only three such cases were found in a series of 450 operative cases.

He states it is not uncommon to find multiple stones in a kidney which appear as one by roentgenogram, and stresses the point that more careful search should be made of the kidney at time of operation to make certain that no stones are overlooked. This formerly was done by needling and digital examination, but at present the use of a fluoroscope at the time of operation is the method of choice and a careful check-up should be made before dismissing a patient.

Roentgenograms made of the urinary tract may frequently be misinterpreted unless supported by careful urinalysis and cystoscopy.

To prevent the formation of multiple stones or the destruction of kidney tissue, the author advises early operation, although he feels that watchful waiting is indicated in cases of small symptomless stones, as they not infrequently are passed spontaneously.

The differential diagnosis was also stressed.

Out of 434 cases that came to operation many had had appendectomies and other operations. In this group with left-sided renal calculi, twenty-one cases had had either an appendectomy or cholecystectomy.

The presence of pus cells or red blood cells in the urine should warrant an x-ray examination.

Pyonephrosis is usually secondary to a single stone, but multiple stones may be secondary to the inflammatory process set up.

The operation of choice in nephrolithiasis is undoubtedly a pelvotomy, as less kidney tissue is destroyed, but in some cases it is necessary to do a nephrotomy which may carry its complications as hemorrhage.

In sudden occlusion of one ureter, there may be no symptoms and 21 per cent make uneventful recovery; 15 per cent require later nephrectomy because of infection. In occlusion of one ureter only, there is a moderate hydro-nephrosis and the obstruction may be present ten days without kidney destruction.

In cases of ureteral obstruction the function of the kidney may be temporarily less than that of impaired kidney, and for this reason the author feels that the cases with nephrolithiasis with coexisting ureteral stones on the opposite side, the ureterolithotomy should be done first.

The possibility that strictures may form following ureterolithotomy justifies one in passing a ureteral catheter ten and twelve days postoperatively.

The recurrence of renal calculi should be less than 10 per cent, but many statistics show a much higher percentage and it is suggested that in some of these cases the stone found at a later date might have been overlooked rather than reformed.

It is true that stones may reform and require a second operation, but a third operation for renal calculi due to reformation is rare.

L. D. POWELL.

BASIC PRINCIPLES AND SUPREME DIFFICULTIES IN GASTRIC SURGERY (Surgery, Gynecology and Obstetrics, January, 1925). This article is a review of 1,000 cases of dyspepsia, 250 of which were gastric or duodenal ulcers. After eliminating the reflex stomach group, spastic stomachs remained. These may be preulcerous. Duodenal and jejunal ulcers arise where the gastric juice impinges on the mucous membrane. Acid of the stomach is controlled by regurgitation.

In a few dilated stomachs without ulcer, resection and destruction of the sympathetics did some good. Ulcer operations should be accompanied by alkalinizing operations, such as pyloroplasty or gastro-enterostomy. In certain ulcer cases an operation called gastric exclusion was done if there was no occlusion of the pylorus. This consists of a Polya in which the pyloric end of the stomach is not resected but the incised end is inverted and sutured.

The low acidity in stomach surgery is apparently due to

regurgitation, as both resection and exclusion operations gave the same acidity. Success or failure lies in causing good regurgitation. In the gastric ulcer stomach, which is large and relaxed, resection is the operation of choice. Gastro-enterostomy is contraindicated in these cases. Gastro-enterostomy failures are of two groups: (1) resulting hyperacidity with jejunal ulcer or recurring duodenal ulcer; (2) cases with marked alkalinization, regurgitation and bile, resulting in nausea and vomiting.

In duodenal ileus obstruction does not seem to be the main factor. Gastric exclusion by sectioning the pylorus and making a modified Polya seems the operation of choice.

In secondary operations on the gastro-intestinal tract Doctor Devine has developed a special retractor which holds back the skin edge and allows good exposure. He always empties a distended stomach by a trocar from behind through the gastrocolic omentum in these secondary operations. In gastrojejunal ulcer resection of the jejunum with removal of the stoma, and pyloric resection of the stomach, is his operation of choice.

J. C. POTTER, M.D.

EXCISION OF THE CERVIX FOR ENDOCERVICITIS: Rattenberg and Schwartz (Surgery, Gynecology and Obstetrics, November, 1924). This author describes a technique for excision of the cervix in the treatment of endocervicitis. The distal end of an infected cervix shows marked inflammatory changes, but as the proximal end is approached near the internal os these changes are either barely perceptible or entirely absent, thus showing the efficacy of the surgical procedure described, so far as the removal of the infected area is concerned.

The operation consists of making anterior and posterior lips by an incision at the external os. Then one-half of the cervix, the entire granular area surrounding the upper portion of the cervical canal, is coned out. A vaginal flap previously liberated is then inverted into the hollowed out shell of the upper lip of the cervix and thus all the denuded areas are covered. The lower lip is then completed in a similar manner. The procedure cures the leukorrhea, does not interfere with normal dilatation during labor, and clears up the focal infection.

J. W. STINSON, M.D.

LATE RECURRENCES AFTER RADICAL OPERATION FOR CARCINOMA OF THE BREAST: George Woolsey, M.D. (Annals of Surgery, 1924, lxxx, 932-933). The author reports three cases of carcinoma of the breast recurring locally twelve to sixteen years after primary operation. While such late recurrences are rarely seen, about eighty-five cases have been collected by Ransohoff (1907, Annals Surgery, clvi, 72), and recently by the author.

Various explanations attribute local recurrence to cancer cells left at first operation. The author believes them to originate probably in the lymphatics of the underlying fascia, which have been permeated. Judd is quoted as saying, "Recurrences in the skin occur more frequently where a large amount of skin has been removed and the fascia saved, than where less skin was taken and a very

free dissection of the superficial and deep fascia was made."

Following removal of one breast for carcinoma, the patient is three or four times more likely to develop carcinoma in the opposite breast than a normal woman of the same age. Carcinoma cells, it is claimed, permeate some of the lymph passages which anastomose across the midline and may lie dormant until some stimulus arouses them to renewed activity. In fifteen cases where pregnancy occurred after removal of one breast for carcinoma, two to ten years previously, thirteen developed carcinoma in the remaining breast, and twelve of them died very promptly.

While it is too pessimistic to believe that we are never justified in pronouncing a patient cured of cancer after operation, yet intensive postoperative radiation is to be urged. It has been proved of definite value in preventing certain recurrences and in postponing the appearance of all recurrences.

JACKSON K. HOLLOWAY, M.D.

INTESTINAL OBSTRUCTION: Clover H. Cooper, M.D., and Barney Brooks, M.D. (*Annals of Surgery*, vol. lxxviii, December, 1923, No. 6, pp. 755-761). The following conclusions were arrived at following experimental work on dogs:

Animals with surgically closed, isolated loops of small intestine may live as long as two weeks. The fluid in the closed loops is very toxic and often several hundred times enough to kill a dog of equal weight in a few hours if injected intravenously.

Death may occur without any decrease in the blood chlorides. This fact differentiates an intestinal obstruction in the small bowel, from the so-called duodenal intoxication or obstruction in the duodenum or stomach. Administration of the NaCl in large quantities does not influence the manifestations of intoxication after intravenous injection of toxin.

The best management is early recognition of the condition and immediate surgical treatment.

Absorption of the toxin is promoted by any interference with the blood supply of the obstructed loop, such as strangulation or distention.

"The factors which influence absorption of toxin are of much greater importance in the cure of intestinal obstruction than the factors of production of toxin. When a patient has a certain dose in the circulation, there is no known method by which the damage done can be alleviated."

W. P. HERBST.

THE TREATMENT OF INFECTIONS—GENERAL, LOCAL, AND URINARY, WITH THE INTRAVENOUS INJECTIONS OF MERCUROCHROME: H. H. Young, M.D. (*Surgery, Gynecology and Obstetrics*, January, 1925). The author emphasizes the failures and successes of intravenous "220" therapy. An important observation is that those patients who have the greatest reactions obtain the greatest benefit. Big doses may be administered, 7.5 milligrams per kilo being the largest. There have been many startling cures by intravenous mercurochrome.

J. C. POTTER, M.D.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

A STUDY OF PNEUMONIA IN INFANTS AND CHILDREN: Rudolph Duryea Moffett, M.D. (*Archives of Pediatrics*, November, 1924). Where digitalis is instituted early, there is never a sudden drop in the pulse rate nor is there a cardiac collapse, which so frequently occurs at the time of crisis. Instead of a sudden drop, the pulse continues regular, slightly lower, then gradually coming down to normal. Children with bronchopneumonia of the influenzal type are more acutely ill than those with lobar pneumonia; however, the mortality rate reported is less than in lobar pneumonia.

The presence of low leukocyte count with a small number of polymorphonuclears is usually an indication of poor resistance. In distinct lobar pneumonia the total white blood cells are uniformly much higher, varying from 25,000 to 40,000, while in the bronchopneumonias, with influenzal infection, they are between 10,000 and 20,000. During the period of acute illness, daily urine examinations should be made in all cases for the early detection of nephritis. Too much stress cannot be placed upon the importance of daily measuring the amount of urine excreted, as a lessened amount is often the first indication in the development of a kidney condition.

An x-ray examination of the chest should be made in all suspected cases of pneumonia. Early in the disease, when there is only dullness present, the x-ray picture reveals a dense area over the involved surface of the lung. In most cases of pneumonia, there is a small amount of pleural effusion. If a culture of the fluid contains the pneumococcus, there is no immediate need for draining the fluid, but if it contains streptococcus or staphylococcus, the condition is more urgent, as the infection is far more severe and should be drained before it spreads throughout the body.

Children are often injured by improper cold air treatment. Certain types of very robust children, well protected, especially about the head and chest, with proper blankets and hot water bottles to their feet, may withstand a colder atmosphere. The temperature of the room should never be below 55 degrees during the day and 45 degrees during the night. This makes for an even temperature without sudden changes from heat to cold. Children with pneumonia take nourishment poorly, consequently it requires persistent urging on the part of the nurse to make them take their food. The forcing of cooling fluids, such as orangeade, lemonade, and cool water as often as possible is very essential. When the temperature is above 103½ degrees, patients are given sponge baths every three hours, with water at 100 degrees. An ice bag is applied to the head and a hot water bag to the feet.

The most important form of treatment in pneumonia is early stimulation from the very onset of the disease. In using the tincture of digitalis, for younger children who are critically ill, a drop of the tincture is given for each pound of body weight in 48 hours. In two days the heart has become digitalized and the dose may be reduced to one-half. Camphor is second to digitalis in producing stimulation. Both digitalis and camphor should be used during the entire period of high temperature and should only be discontinued after the temperature has been normal for 24 hours. If stimulation is instituted early the heart muscle is better able to withstand the extra strain under which it labors.

R. N. ANDREWS, M.D.

A CLINICAL REVIEW OF INTUSSUSCEPTION WITH REPORT OF CASES: Eugene H. Smith, M.D. (Archives of Pediatrics, November, 1924). Intussusception is not a rare disease, yet its rate of incidence is such that the personal experience of the average physician is usually limited to comparatively few cases. The fact that instances occasionally occur in which the true nature of the trouble is not recognized, justifies the report of the small series of cases which follows. The further fact that a few hours' delay in making a diagnosis and in the institution of treatment may result in a tragedy, gives sufficient warrant for a clinical survey of this condition.

Onset: The time of onset can frequently be determined almost to the minute. An infant in apparently perfect health is seized while playing quietly on the floor, or is awakened from sleep, cries out sharply, and usually soon vomits.

Pain: Pain is present from the onset, is intermittent, and is usually so severe as to cause the child to cry out sharply, and for the moment to present the picture of extreme suffering, with drawn face, taut muscles, and perhaps profuse perspiration.

Vomiting: Vomiting occurs rather early, and usually comes on during or immediately following the paroxysm of pain.

Bloody Stools: A voluntary movement of the bowels may occur early. At first more or less normal fecal material appears, but within a few hours, blood in varying quantities is passed, either spontaneously or following the giving of an enema. In the rarer cases, in which no blood appears externally, its presence on the examining finger, following a rectal examination, should arouse suspicion as to the real nature of the trouble.

Tumor: The whole of the abdomen should be thoroughly explored, since the tumor may change its position from time to time, and may occupy any part of the cavity. If the child has an intussusception, the tumor is there, and every possible means should be used to detect its presence or absence. A rectal examination should always be made in cases in which any doubt exists. The presence of a cervix-like mass, with the typical slit-like opening, clears up any doubt as to the nature of the tumor, and sometimes reveals its presence, when, for any cause, abdominal palpation is unsatisfactory.

R. N. ANDREWS, M.D.

ROENTGENOLOGY

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PHOTOGRAPHIC DARK ROOM ILLUMINATION AND FLUOROSCOPIC DARK ROOM ILLUMINATION: By E. B. Knerr, M.D. (January Radiology, 1925, vol. iv, No. 1). Every dark room worker knows the use of the ruby red light in the dark room. A great advance over the ruby light has been attained in the substitution of green and yellow, combined by passing the light through screens of these colors.

The human eye is more responsive to green tinted illumination than to any other color, doubtless because of the influence of the green tints of natural surroundings. The trees, grass and other foliage have always been impressing their influence on the retina, whereas the red impression from natural sources is comparatively rare. The other old time thought was that the wall should be of a dark color, even black, but such is not the case. It should be painted white or gray as the walls will reflect only such rays as fall upon them from a photographic safe light. With such a volume of green light reflected from the walls and furnishings in the dark room the comfort as well as the efficiency of the operator's eyes is beyond comparison with that experienced through ruby or any other illumination.

The total darkness usually sought for in the x-ray fluoroscopic room is not necessary or even advisable. Much advantage may be secured to fluoroscopic observations by having the room faintly illuminated by a dull olive green light. It should be faint, but of sufficient intensity to make visible the objects about the room, and it should be continued during all fluoroscopic work.

The advantages that such illumination of the fluoroscopic room have for the operator, consultants and patient, are as follows:

1. Eyes accommodate more quickly.
2. The retina is rested for the particular tint of the actuated fluoroscopic screen and the contrast of its shadows deepens.
3. There is a more restful feeling for the patient as his eyes are accommodated to visible objects and he can see when green light is on.
4. When giving barium meals and sinus injections during fluoroscopic examination, assistants, nurses, and the technician can see what they are doing.

The light furnishing illumination should be so installed so as not to cast direct rays into the face of observers or upon the glass surface of the fluoroscopic screen. The principles of indirect illumination should be followed.

C. H. HAVER.

A CLINICAL STUDY OF SOME ANATOMICAL ABNORMALITIES OF THE COLON: Kantor (*Am. Jour. Roent.* 12: 414, Nov., 1924). Redundant colon is present in 9 to 14% of all persons and in 23% of all constipated individuals. It is more common in sthenic than in asthenic people.

Symptoms appear as a result of stress or abuse of colon function. They are chiefly constipation, gas distress and pain, while volvulus occurs rarely.

The diagnosis can only be made by the roentgen examination and is best done by use of the barium enema. The redundant loops are usually found in the descending and pelvic colons and may take various forms.

The therapy consists of restoration of colonic function by the usual methods and the author advises against surgery.

LEO G. RIGLER, M.D.

THE X-RAY APPEARANCES OF TUBERCULOUS JOINTS: R. W. A. Salmond (*Tubercle* (London), Dec., 1924, vi, 123). The channel of infection being the blood stream, it is important to know the distribution of the blood vessels at the end of the bones. The radiographic pictures differ accordingly as the joint is involved secondarily from a lesion in the bone near the epiphyseal cartilage or primarily from the synovial membrane. Primary bone disease is more common in children. A negative radiographic opinion should not outweigh a careful positive clinical one. Help may be gotten from screening the chest. Increased translucency or rarefaction of the bony structure is nearly constant in active tuberculous disease and is due to absorption of lime salts. All the bones of the subject may show it. Very rarefied bone is demonstrated with greater detail by the use of a suitable soft tube. The bones and soft tissues in the neighborhood of the joint show atrophy after a time. When the disease starts near the end of a long bone, no abnormal appearance is caused until the nutrition of the trabeculae is interfered with, when an area of rarefaction appears. The irregular distribution of the granulations gives a worm-eaten and indistinct appearance to the bony structure. If a sequestrum is formed it appears as a lighter area lying loose in the area of rarefaction. Activity may sometimes be indicated by the lack of definiteness in the margin. Farther out reactive sclerotic osteitis may be indicated by a denser white area around the focus. Both osteoporosis and osteosclerosis may grow at the same time. Periarticular abscess may cause haziness around the joint.

When the disease starts in the synovial membranes for a time no changes are visible; later rarefaction of the bones occurs and the joint cavity shows increased density and becomes distended in outline. Eventually the articular margins show irregular and gouged out borders. After the bones are involved the appearances are much the same as in primary bone infection invading the joint.

In healed joints the appearance varies according to the amount of destruction. Complete bony ankylosis may occur. A healed joint loses most of the rarefaction and the structure of the bony trabeculae becomes more definite as contrasted with the hazy, indistinct appearance of a still active lesion.

A. T. LAIRD.

THE DIAGNOSIS OF DILATATION OF THE BRONCHI IN CHILDREN BY MEANS OF THE INJECTION OF IODINIZED OIL: Armand-DeLille and Gelston (*Amer. Jour. Dis. Child.* 28: 527, Nov., 1924). In children the differentiation of bronchial dilatations from tuberculosis, pulmonary and supradiaphragmatic abscess, is often very difficult. The importance of this is obvious. The injection of iodinated oil into the bronchi, preferably by means of the tracheal route, followed by roentgenograms taken in the vertical and prone positions, will usually establish definitely the presence or absence of bronchial dilatations. A film of the uninjected lung should be taken previously.

Dilatations of the bronchi and bronchiectases manifest themselves as multiple shadows joined to a bronchus by a pedicle, as simple dilated bronchial shadows, or as enlarged shadows along the smaller bronchi. These can easily be distinguished from either parenchymal or pleural cavities.

This method, first described by Sergent and Cottenot, appears to be entirely harmless and, in fact, the presence of the iodine in the cavities seems to have some beneficial effect.

LEO G. RIGLER, M.D.

ERYTHEMA AS A UNIT IN DEEP ROENTGEN THERAPY DOSIMETRY: Leddy and Weatherwax (*Am. Jour. Roent.* 12: 514, Dec., 1924). Dosage in therapy is generally based upon the amount of radiation necessary to produce a skin erythema. This is such a variable and uncertain factor that it should be abandoned as a standard for dosage. Different degrees of redness can be produced by doses which vary by 50% without going beyond the classification of erythema. This leads to much confusion in attempting to standardize dosage in any condition.

The threshold value for erythema, that is the quantity of radiation which will just fail to produce erythema, is much more constant and more definitely ascertainable. Different degrees of redness cannot be measured but the difference between erythema and the absence of erythema is sharper.

The authors suggest that reports of dosage be given in full, including the time factor, and that the factors used be considered, rather than the percentage of skin erythema.

LEO G. RIGLER, M.D.

CIRRHOSIS OF LUNG: Saute (*Radiology*, Aug., 1924). Nine cases of pulmonary fibrosis, which the author calls "chronic diffuse interstitial fibrosis," are reported. The roentgen findings of most importance are a dense or mottled shadow involving the whole or part of one lung, elevation of the diaphragm, narrowing of the intercostal spaces, and retraction of the mediastinum and heart toward the affected side.

Most of the cases were due to pneumonia, or abscesses and plastic pleurisy following pneumonia. There is considerable discussion as to the etiology, especially as to the possibility of syphilis being a factor.

LEO RIGLER.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

PRACTICAL LECTURES. Delivered under the auspices of the Medical Society of the County of Kings, Brooklyn, N. Y. 1923-1924 series. 484 pages. 132 illustrations and 3 color plates. Cloth, \$5.50. New York: Paul B. Hoeber, Inc., 1925.

AN AFRICAN HOLIDAY. Richard L. Sutton, M.D., Fellow of the Royal Geographical Society of Great Britain. 180 pages. 102 original illustrations. Cloth, \$2.25. St. Louis: C. V. Mosby Co., 1924.

INFECTION, IMMUNITY AND INFLAMMATION. Fraser B. Gurd, B.A., M.D., C.M., F.A.C.S., Montreal. 329 pages. Cloth, \$5.00. St. Louis: C. V. Mosby Co., 1924.

OPERATIVE SURGERY. J. Shelton Horsley, M.D., F.A.C.S. 784 pages. 666 original illustrations. 2nd edition. Cloth, \$12.50. St. Louis: C. V. Mosby Co., 1924.

MEDICAL AND SANITARY INSPECTION OF SCHOOLS. S. W. Newmayer, A.B., M.D. Lea and Febiger, 1924. 462 pages. Price \$4.00.

The experience of the author enables him to present the subject in an able and effective manner.

This small volume should be appreciated by those interested in school hygiene. The book is recommended to the school physician as a guide in constructing a Bureau of Hygiene. The school nurse will also find it a helpful aid in her duties.

Physical defects and communicable diseases receive special consideration. There are other chapters devoted to construction and inspection of grounds and buildings, medical supervision and mentality.

A. E. NICHOLS, M.D.

MANUAL OF THE DISEASES OF THE EYE. Charles H. May, N. Y. C. 445 pages. Illus. Cloth, \$4.00. William Wood & Co. New York.

May's Manual of the Diseases of the Eye is, perhaps, more widely read by students of ophthalmology and general practitioners than any other book of its kind. The fact that it is now in its eleventh edition and has been translated into Spanish, French, German, Dutch, Japanese and Chinese is sufficient evidence of its merit. The present edition contains 374 original illustrations, 23 plates and 73 colored figures. It differs from its predecessor in that the chapters on uveitis and disturbances of mobility of the eye have been rewritten.

PAUL D. BERRISFORD, M.D.

PRINCIPLES OF BIOCHEMISTRY. T. Brailsford Robertson, Ph.D., D.Sc. Lea & Febiger. 1924.

The advances made in recent years in general medicine and allied subjects has been paralleled or even surpassed by the development of biochemistry. This book contains all the fundamental steps leading up to the establishing of biochemistry as a definite study and interpretation of life phenomena by the application of the known principles of chemistry and physics.

Robertson has not only by very intensive study and review of the literature, but also by his own experiments, managed to correlate and to establish biochemistry as a definite entity. The chapters on "Food" present a very thorough discussion of the chemical processes involved in the digestion and assimilation of the various elements of the diet and the elimination of waste material. The sections "The Properties of Protoplasm" and "Chemical Correlation of Tissues" discuss the various physiological processes from a biological standpoint.

This book fills a definite place in the progress of medicine and can be appreciated by the student, physician and scientist.

C. K. WILLIAMS, M.D.

A PRACTICAL COURSE IN STANDARDIZED PHYSIOTHERAPY, under auspices of Biophysical Research Department of Victor X-Ray Corporation, is now available to physicians. Offers a highly practical knowledge of all the fundamental principles that go to make up the standards of modern scientific physiotherapeutic work. Course requires one week's time. For further information apply to J. F. Wainwright, Registrar, 236 South Robey Street, Chicago, Ill.

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MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association
Northern Minnesota Medical Association and Minneapolis Surgical Society*

VOL. VIII

APRIL, 1925

No. 4

THE SILENT ANTRUM*

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Fergus Falls, Minnesota

The hunt today for infective foci is relentless. Some, over-zealous, make pot-shots which sacrifice the innocent; still, the addition of fifteen years to man's life expectancy is sufficient triumph to excuse an occasional reckless hunter.

Enthusiastic as we are in this hunt, it is safe to say, the keenest occasionally pass dangerous prey unnoticed. My observations have convinced me that one of the safest hiding places for germs is the maxillary antrum. Here they are passed by the mightiest hunters.

That germs, once safely lodged in the antrum, are so frequently undisturbed, is largely due to the fact that our education has led to the belief that empyema of the antrum maxillare must produce certain classical symptoms such as nasal obstruction with manifest difficulty in breathing, unilateral nasal discharge, and pain in and around the antrum.

This paper makes no pretense of scientific excellence. It aims, simply by presenting a few illustrative cases, to call to your attention how far astray one may be led if too much dependence be placed on subjective manifestations, as a large percentage of those affected with an infected antrum are unconscious of any head trouble.

That the subjective manifestations of a chronic antrum may be nil, and be overlooked by men of ability, is illustrated by the following cases:

Olga J— had been in the hands of two very capable diagnosticians, because of joint disturbances suggesting focal infections. All foci were thought to have been eliminated.

She came to me troubled with blurring of vision and pain in the right eye when doing close work.

Refraction showed one diopter of hypermetropia with astigmatism. This was corrected, with complete relief of

the blurring, but occasional pains through the right eye continued.

There was no nasal manifestation, the air spaces being adequate in both nostrils, the turbinates normal in size, and the mucous membranes healthy. She was sure she had no head trouble, though eight years previously she had been treated for acute frontal sinusitis. This had readily cleared up under local treatment.

Transillumination showed a very dark right antrum, confirmed by the roentgen ray. Trocar washing gave a large amount of thick yellow pus.

Another case is that of Doctor B—:

Doctor B— complained of soreness and pain in his right elbow, also a numbness and tingling on the left side of his tongue. When told that his left antrum was absolutely dark and there was probably pus there, he refused to accept the diagnosis, because he never had any trouble with his nose. As a matter of fact, the air spaces were adequate, membranes healthy, and there was no sign of discharge. He was only convinced by a Rochester confirmation.

That antrum infection is common, but often undiagnosed, is shown by post-mortem findings of J. P. Tunis, of Philadelphia. Thirty-seven out of one hundred heads examined showed some evidence of pathological change. Of the thirty-seven, eleven were examples of edema, twelve of chronic inflammation or empyema; though in none of the cases was death due to diseases with which empyema of the antrum is especially associated. For example:

Tuberculosis caused the death of twenty-one, with only one showing antral tuberculosis. The most significant feature is the fact that only one of the cases was diagnosed during life.

Even though the figures given by Tunis are high, and throughout the country the incidence of antrum involvement is considerably less, it would still be frequently present in every practice. When a large general practice does not bring to light a number of antrum infections each year, the conclusion must be that they have been overlooked. To discover these antri is chiefly the work of the general practitioner, because, as stated before, the head disturbance is not usually sufficient to drive the sufferer to a specialist.

In searching for possible infection in the nasal

*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, October 10, 1924.

accessory sinuses, one must consider the antrum of Highmore, the frontal, anterior, middle, and posterior ethmoidal and sphenoidal sinuses. These have been grouped clinically, for convenience, into two series:

1. Maxillary, anterior ethmoidal, and frontal, emptying into the middle meatus; that is, below the middle turbinate.

2. Posterior ethmoidal and sphenoidal sinuses, draining into the superior meatus; that is, above the middle turbinate.

All the accessory sinuses have drainage openings. In some, as in the frontal, it is direct; that is, the ostium is in the floor. The ostium of the maxillary sinus is high above the most dependent portion, so drainage depends upon the cilia of the epithelial lining. This location of the ostium, and its relative small calibre, are important factors in the inflammatory processes which involve the lining mucous membranes. The lack of adequate drainage and ventilation increases the number of infections and hinders recovery.

Some authorities attach no importance to these anatomical peculiarities, insisting that one hundred per cent of all antral infections are due to devitalized teeth (Tubey). As the antrum is at times involved in the absence of diseased teeth, and as infections which frequently occur in the other accessory sinuses cannot be ascribed to the teeth, this position seems untenable. The teeth, nevertheless, must be given first consideration in etiology. Frequently recurring colds may be acute exacerbations of a chronic antrum infection with a tooth origin. The case of Alfred L— is quite typical:

This patient had doctored a number of years for colds in the head. These attacks began with severe sneezing. In the course of twenty-four hours, the left nostril became completely occluded, and finally the right. A very severe unilateral headache then developed. If the membranes were kept contracted by frequent applications of adrenalin, the headache was soon relieved, and the attack terminated.

Examination showed pus in the left antrum. The removal of a dead premolar, with doubtful roentgen ray findings, gave early and permanent relief.

Interpretation of dental films, as to the relation of the antrum to the tooth roots, requires much skill and experience. If the root tip comes into immediate contact with the antral wall, there will be no area of bone softening and absorption. For this reason, many vicious teeth escape detection.

Antral infection may be a part of a similar in-

fection of the nasal mucosa. These usually terminate in resolution provided there is adequate drainage and ventilation; if not, ulceration may occur and the process extend to the bone, inducing caries, or terminate in the chronic form of disease, the mucosa gradually thickening and proliferation of connective tissue taking place. If the periosteal layer is involved, polypoid masses or osteomata may develop.

Chronic antral infections may be discovered accidentally during a secondary infection, as in the following case:

Mrs. S., a doctor's wife, was brought to the hospital on account of an alarming attack of acute laryngitis, bordering on edema. Strangulation was feared. The usual remedies were applied. In a few days, the distressing symptoms subsided, to be followed by a very severe unilateral headache. Some swelling developed over the left cheek, the nose became obstructed, and the breath foul. There was no nasal discharge.

The left antrum was extremely dark to transillumination, and, on being washed out, showed a very foul pus.

This patient gave a history of previous attacks of laryngitis associated with headache. For two years she had been very nervous, sensitive to noises, and irritable; all of which is foreign to her nature. She also occasionally had neuralgic headaches, which were better in the morning and made worse by stooping. In spite of these suggestive symptoms presented daily to a capable physician, the antral infection was not suspected.

An important point in examining the nasal fossæ is the thorough contraction of the membranes by the use of adrenalin cocaine spray, or application. If this is made a rule, many mistakes will be avoided. After the membranes are blanched, careful search should be made for pus issuing from a fossa. If none is evident, negative pressure should be induced by the use of the suction bulb. If pus then presents in the middle fossa, it remains only to determine from which of the three sinuses in the first series it comes. Transillumination, roentgen-ray, and puncture are the chief tools used in the differentiation. Transillumination should not be omitted, even if no pus presents, as frequently its character is such that it cannot, or does not, pass through the ostium.

Pain is a very misleading symptom. It is usually present in acute cases, often unilateral and severe. In the chronic, it is most often absent, as illustrated by the following case:

Miss N— for three years had been annoyed by a foul smelling nasal discharge. Nasal douches of various descriptions had been prescribed by several physicians. She ex-

perienced no discomfort, aside from the annoying discharge. Permanent drainage of an infected antrum gave complete relief.

Pain usually indicates retention due to partial or complete closure of the ostium. This may be caused by thickening of the membranes, polypoid growths, or heavy secretions. Pain, when present, is usually through the cheek or around the eye. It may, however, be removed and suggest some other lesion, as in the patient here reported:

Mrs. K— had been annoyed for years with droppings in her throat at night. There was no disturbance during the day, except an occasional bad breath. There was no nasal obstruction, pain or tenderness over the antrum. For some years she had periodic pain in the right ear and mastoid. This pain was much exaggerated when she had a cold in the head and in chilly weather.

On examination, the ear and mastoid were negative, but the right antrum was filled with pus. Drainage completely and permanently relieved the pain in the right ear.

Tenderness, elicited by pressure over the canine fossa, is only present in the same type of cases as give localized pain over the antrum. This tenderness may extend to all the upper teeth on the affected side, making mastication very difficult.

Transillumination should always be used, but carefully interpreted. This simple procedure, if routinely applied, would save many an error. A dark room is necessary, and a good rheostat indispensable, as it is only by observing under various degrees of light intensity that accurate findings can be made. Frequently only very weak light will give the contrasts. The test is purely comparative, but quite reliable, as the normal antri seldom vary in size or density of walls. A dark antrum may be due to an old healed process, or very rarely, to anatomical peculiarities. In the absence of other nasal findings, two antri illuminating easily and equally justify the conclusion that they are normal.

In cases where transillumination reveals differences in antral density, roentgenograms should be taken. Such pictures are very valuable, not alone in confirming other findings, revealing differences in densities and abnormalities, outlining the size and shape of the sinuses, and the position of the floor, but also, if skillfully taken and interpreted, by greatly assisting in determining complicating frontal, ethmoidal, and sphenoidal involvement.

Trocar puncture through the nasal wall of the antrum and under the middle turbinate at its at-

tachment, usually gives incontrovertible evidence; so it is the final proof and court of last appeal. These punctures, when good anesthesia is secured, are not very painful, but are never pleasant, and are properly reserved to the last.

Through the trocar, the contents of the antrum can be washed out the natural opening. If the water returns clear, it is good evidence that there is no pus present; provided the trocar actually entered the antrum, and the secretions are not too tenacious. The following case illustrates this point:

Miss D— had for the past year been greatly distressed by joint pains and tenderness. Dead teeth and diseased tonsils had been removed without the hoped-for relief.

Re-examination revealed a very dark right antrum, with other sinuses negative. Trocar washings were negative for several washings (at the one sitting). However, after agitating the fluid in the antrum and having her tip her head to the left, a heavy tenacious pus was washed out.

Treatment.—One of my most lasting impressions from a great clinic, held some twenty years ago, is of a woman who was exhibited to our admiring gaze from time to time over a period of months. Her disease, a suppurating antrum, was considered rare. She had rubber tubing extending from the alveolar process, through the antrum, out the nostril. It was demonstrated how nicely an irrigator could be connected, through-and-through drainage secured, and thus a rapid cure accomplished. When I graduated this rapid cure was progressing favorably. Antrum therapy has made great strides since then, but some are still anchored to the past.

Remove all dead teeth which are at all suspicious. If this is not done, cases will be relieved, only to return again.

Acute cases should be treated several times daily, by use of a solution of cocaine and adrenalin in water or alypin. There is a marked tendency to tumefaction of the nasal mucosa, which stops drainage and halts progress. This remedy may be applied as a spray, but best results are secured by direct application to the ostium maxillare. When blanching is thoroughly accomplished, suction should be used, either by syringe or suction irrigation. The suction irrigation is very useful in all sinus infections.

If there is not prompt relief, irrigation through a puncture needle should be instituted. After thorough irrigation with salt solution, a solution of 20 per cent argyrol can be left in the cavity. Barring

complications, acute cases should rapidly cease after a few punctures.

Irrigation is not pleasant, and is time-consuming; therefore, unless relief is manifest and prompt, the intra-nasal operation should be resorted to. This gives early relief, is easily done, and occasions no subsequent scabbing or annoyance. Radical and mutilating operations are rarely or never necessary.

Conclusions.—1. Acute and chronic infections of the maxillary antrum are common in every-day practice.

2. A very small percentage of antral infections are diagnosed early; most remain for years, and many are carried to the grave.

3. Part or all classical symptoms may be absent. Therefore, most antral infections will be found only by hunting for them.

4. Good treatment is based upon drainage and ventilation. When this is provided, the mucosa rapidly returns to normal in acute cases, and ultimately in most chronic cases.

5. When permanent intra-nasal drainage is established, few or no subsequent treatments are necessary.

6. Radical and mutilating operations are never necessary in acute infections and are rarely necessary in the chronic infections.

DISCUSSION

DR. HORACE NEWHART (Minneapolis): Dr. Burnap in his very excellent paper has done a distinctive service to the profession in pointing out to us the importance and relatively frequent occurrence of latent maxillary sinus disease. The discovery of the possibilities of latent maxillary disease has revealed a new and heretofore overlooked causal factor existing in many general manifestations of a focal infection, as for instance nephritis, multiple neuritis, arthritis, cardiac disease, etc.

I believe no one is more familiar, however, with the difficulties of diagnosis in this field and with the possibility of overlooking the latent maxillary sinus than the rhinologist. The classical methods of diagnosis as far as we have employed them are by no means in all cases absolute and final.

Take for instance transillumination. After reading our text-books it would seem easy by transillumination to recognize at once a pus-filled or diseased maxillary sinus. But in actual practice we find a very considerable number of cases which transilluminate unsatisfactorily because of the effects of previous attacks of inflammation with consequent thickening. This difficulty is especially apparent in those cases in which both sides are involved when there is no normal translucency for comparison.

The x-ray which we formerly regarded as almost infallible in sinus work, we find after a larger experience to be capable of leading us into error of diagnosis. As an adjunct in diagnosis it is invaluable, but must be checked by our clinical findings. To illustrate, only a few months ago one of our prominent physicians brought in his wife with a positive diagnosis of double maxillary empyema, both sides being very definitely involved, according to the very excellent plates which accompanied the patient. There was an abundant purulent discharge from both nares. Puncture and washing revealed absolutely no pus. The apparent involvement as shown on the x-ray plates was due to changes in the density of the walls from former attacks. The correction of a deviated nasal septum promptly cured the patient of all symptoms. Once in our experience, guided by the x-ray and the patient's complaint of persistent pain, we did an exploratory operation of the sinus through the anterior maxillary wall, only to find the antrum entirely normal.

As regards the matter of puncture, it should be noted that even here at times we may be absolutely at a loss, or the findings may be negative. This is especially apt to be the case when there is a congenital absence of a natural ostium which occurs in quite a percentage of cases, or the natural ostium may be occluded by the swollen lining membrane, or by the presence of polypi acting like a ball valve, or there may be occlusion caused by the presence of inspissated pus. Therefore I would warn against making an absolutely positive diagnosis by any one of the usual methods.

We have personally come to look with suspicion upon every case presenting a chronic nasal discharge with or without pain, but with remote symptoms when there is a high deflection of the nasal septum; for here we have a condition which, because of poor ventilation and drainage invites repeated attacks of rhinitis. In such cases where there is any suspicion we urge at once making the diagnostic puncture and washing.

Unfortunately I am obliged to sound a rather pessimistic note in connection with one of the conclusions of the essayist, and that is in regard to the ease with which these cases clear up as a result of endonasal operation. We have found it vastly more satisfactory in many of these chronic cases to do the radical operation of Caldwell-Luc for the reason that from the very start we have all the advantages of an exploratory operation, revealing absolutely the contents and condition of the cavity itself. This operation is not mutilating or severe or deforming. It presents no disadvantages over the endonasal method with every advantage in its favor.

I wish once more to congratulate the author on putting this subject on the program of our State Society. Heretofore it has been discussed largely in societies of specialists, but after all it is the man on the firing line, the general practitioner or the pediatrician, who sees these cases first. He should be on his guard and should suggest the possibility that the symptoms for which the patient consults the physician may originate in a latent maxillary sinusitis.

DR. J. T. SCHLESSELMAN (Mankato): There is very little that anybody can add to the fine paper of Dr. Burnap's and

the discussion by Dr. Newhart, but I wish to call attention to one point in diagnosis and that is the use of the stereo x-ray in sinus examinations and in all head pictures. I had a case come to my attention a week ago of which I have a stereo-picture. It is impossible to throw a stereo-picture on the screen, so anyone wishing to see it can see it in the lobby of the Breen Hotel. A stereo-picture gives a much better view of the intracranial and head conditions. Anyone taking a look at it can see how it would show the details of conditions in the sinuses and especially in the deeper sinuses like the ethmoids and the sphenoids.

There is one other thing that I would like to mention and that is the idea some have that the washing out of the antrum is a very harmless procedure. Literature shows that not infrequently a patient goes into collapse or shock while washing out the antrum. The reason for that probably is that the ostium is closed up by secretions or polypoid masses and pressure is being used. But I think that if care is taken after the trocar is entered and air put through, little danger will be encountered.

DR. W. E. CAMP (Minneapolis): I would like to say a few words commending Dr. Burnap on his splendid paper and the discussion which has followed. We have been fortunate in seeing, in the last two or three years, quite a large number of cases of both acute and chronic maxillary sinusitis; in many of these, particularly the chronic ones which have been operated by the radical operation, we have examined the tissues microscopically. They all show considerable round cell infiltration with cystic and mucoid degeneration of the mucous membrane and the formation of polypi, typical mucoid polypi, which are frequently found in the nose in cases of chronic maxillary sinusitis. As to the dental origin of chronic maxillary sinusitis it has been our experience that most of them are not of dental origin. Although two or three of them have shown pathology in the mucous membrane near the roots of the teeth or on the floor of the antrum, most of them showed involvement of the entire mucous membrane.

We had two very interesting pathological examinations from these cases. One of them was a chronic cystic inflammation, resembling cystic disease which occurs in the endometrium of the uterus. In fact, examining this specimen microscopically it would be almost impossible to differentiate it from a chronic cystic endometritis. The other case was an elderly woman who had trouble with her antrum for several years, accompanied by pain. Examination of the nose presented a mass in the middle meatus. We thought at once of malignancy, owing to her age and pain, but upon exploring the antrum by a radical operation it was found to be completely filled with a friable necrotic mass, which upon microscopic examination proved to be a chronic necrotizing empyema. These two cases were very instructive to us, showing the marked change which might occur in a chronic empyema of the maxillary sinus.

In closing I would like to say a few words stressing what Dr. Newhart has said in regard to the external operation. In our experience it has been much better to go in through the canine fossa, which enables one to get a good look down into the maxillary sinus and to make a counter opening into the inferior meatus.

SPLENECTOMY IN CASES OF PURPURA HEMORRHAGICA*

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The demonstration of marvelous improvement and probable cure following splenectomy for thrombocytopenic purpura hemorrhagica, which has been a feature of the literature since 1916, is the most interesting and the most important contribution to the treatment of diseases of the blood since the adoption of splenectomy for hemolytic jaundice; it also suggests new possibilities in the physiology of coagulation, in the study of the function of the spleen and the effect of splenic function and dysfunction on the capillaries, the bone marrow, and on coagulation of the blood. Thrombocytopenic purpura hemorrhagica may be acute, from several days to a few weeks in its course; subacute, with a duration of months or a year or two; or it may be chronic, lasting from ten to twenty years. Acute cases are very rare. The chronic types frequently date from childhood and are remittent in character. The disease usually begins with petechiæ on various portions of the body, to be followed in weeks or months by epistaxis, bleeding from the gums, and, in women, menorrhagia and metrorrhagia; occasionally there may be bleeding from the gastro-intestinal tract and from the urinary system, and later cerebral hemorrhage not infrequently occurs. The spleen may or may not be palpable; it can usually be felt, however, and is occasionally considerably enlarged. The mildest cases may recover spontaneously after the removal of foci of infection or following transfusions. In the resistant cases, whether mild or severe, horse serum, thromboplastic material, radiotherapy, calcium chlorid intravenously, ergot, local styptics, and mechanical packing, are only of temporary benefit. Transfusions at short intervals, every few days, are essential at times to maintain the blood and general condition, and may carry the patient through to a remission. The uncontrollable bleeding may be terrifying to the patient, the family, and the physician; the victim is often a young, otherwise robust, individual.

The most important features of the blood in the

*Read before the Minnesota State Medical Association, October 9, 1924, St. Cloud.

differential diagnosis of purpura hemorrhagica are: (1) a low platelet count, usually between 20,000 and 30,000, (2) a long bleeding time, after a clean puncture wound, (3) a normal coagulation time when blood is carefully taken directly from the vein and allowed to coagulate in a tube, (4) an absence of the normal retractility of the clot, and (5) a positive tourniquet test, the appearance of petechiæ on the application of a tourniquet to the arm for three minutes at a pressure midway between the systolic and diastolic readings. In cases of hemophilia, by contrast, the most important findings are: (1) a prolonged coagulation time when the blood is drawn directly from a vein, (2) a normal or somewhat prolonged bleeding time, (3) a normal number of platelets, and (4) a positive history of heredity, frequently with the presence of joint changes and hematomas. Acute aplastic anemia in its later phases may be difficult to distinguish from purpura hemorrhagica. Aplastic anemia shows an extreme degree of leukopenia, with a correspondingly low platelet count, and the appearance of hemorrhagic manifestations usually later than the anemia. Acute aplastic anemia may simulate hemorrhagic purpura so closely that definite differentiation is impossible. The persistent leukopenia in acute aplastic anemia is of especial importance as a diagnostic feature, and a great deal of stress may be placed on this finding when all other findings are identical with those of hemorrhagic purpura.

Besides hemophilia and acute aplastic anemia, other diseases may offer difficulties of diagnosis, especially acute leukemia in which the leukocyte count is normal or leukopenia is present. Here a careful study of the smears for immature cells is essential. There is, moreover, an occasional type of hemorrhagic disease which cannot be classified satisfactorily, either because of a normal platelet count associated with other features suggestive of hemorrhagic purpura, or the occurrence of a family history indicative of hemophilia associated with clinical manifestations of purpura and coagulation factors of a mixed type.

Port and Aiyama splenectomized normal rabbits and demonstrated an increase in the platelet count in all instances. An increase in the platelet count has been noted following splenectomy for various syndromes in man. It had also previously been recognized that the hemorrhagic tendency became temporarily less marked following splenectomy in

certain cases of pernicious anemia and leukemia. This association of spleen with the platelet count, and the hemorrhagic tendency, led Kaznelson, in 1916, to suggest splenectomy for thrombocytopenic purpura hemorrhagica. His patient had had recurrent attacks of severe purpura hemorrhagica for ten years. During the five years following splenectomy up to the time of a subsequent report in 1921,⁹ there had been no recurrence of purpura or hemorrhage. The patient may be regarded as cured. Brill and Rosenthal were the first to direct attention to the subject in this country. The first patient in the Clinic was mentioned in a discussion of the paper by Brill and Rosenthal and again in an article by Giffin and Holloway. The patient had a very severe type of the disease; she is apparently well twenty months after splenectomy. The publication of other cases is justifiable in order to arrive at as clear a conception as possible of the type of purpura which may be submitted to splenectomy, of the surgical risk involved, and of the probable postoperative course. In this paper the first four cases of splenectomy will be reviewed. Cases 1 and 2 were mentioned in an article by W. J. Mayo. In a forthcoming number of the Medical Clinics of North America four additional cases will be reported.

REPORT OF CASES

Case 1.—A woman, aged thirty-one years, came under observation December 20, 1922. She was in very poor general condition and moderately anemic. A history of hemorrhagic disease in the family was not obtained. She had had a tonsillectomy in 1916 without excessive bleeding; in 1917, she had had a slight illness suggestive of cholecystitis. In October, 1921, petechiæ and purpuric areas were noticed about the hips and thighs. A month previously she had given birth to a normal child without untoward incident. In December, 1921, a tooth was extracted, with excessive bleeding for three days. During the following nine months petechiæ and purpura appeared and reappeared on the legs and thighs; at times the condition was quite severe. In September, 1922, the patient had contracted severe rhinitis. About October 1, slight bleeding occurred; a week later the bleeding was severe, necessitating packing. This continued to recur, and the patient was given two small transfusions. November 3, she began to flow for the first time since the preceding pregnancy and bled profusely for seven days. She became very anemic and a series of transfusions was necessary. During this period bleeding from the nose and gums occurred intermittently. December 6, severe uterine bleeding recurred and continued for ten days; uterine packing was necessary. There had been no bleeding from the gastro-intestinal or urinary tract.

The patient's hemoglobin was 55 per cent, and the erythrocytes numbered 3,260,000. A differential count showed

nothing of importance. Petechiæ were present over various parts of the body, including the mouth, and there was intermittent bleeding from the nose and gums. Platelet counts were quite consistently under 100,000, not infrequently below 75,000, several times below 50,000 and once 24,000. Coagulation time by the Lee method was normal; bleeding time was prolonged and was associated with soft clot. The prothrombin time was constantly prolonged, and the tourniquet test was very definitely positive. The spleen was palpable. A Wassermann test was negative, and it was impossible to demonstrate any clinical evidence of syphilis. Blood cultures were negative; a search for foci revealed only one periapical abscess. The gallbladder and the uterus and adnexa were somewhat under suspicion because of the previous history.

Radium exposures over the spleen and calcium chlorid intravenously resulted in only a temporary effect on the coagulation, and 500 mg. hours of the intra-uterine application of radium was without effect. In January, 1923, excessive menstruation recurred, and transfusions were begun. Courses of coagulen and thromboplastin were given without definite effect on the coagulation time or platelet count. For a period of forty days twelve transfusions were necessary to maintain the patient's condition. However, January 26, an infected tooth was extracted without prolonged bleeding. January 30, menstruation again began, and the uterine bleeding was of varying degrees of severity for thirty days, necessitating uterine packs and repeated transfusions. During this period the erythrocytes dropped to 1,610,000 and the hemoglobin to 18 per cent; the color index was less than 1, and the leukocytes varied from 4,000 to 7,000. By March 5, the erythrocytes had risen to 3,310,000, and the hemoglobin to 56 per cent, but the patient was very much exhausted as a result of her long continued illness.

Splenectomy was done March 7, 1923 (C. H. Mayo), and was followed immediately by transfusion. The spleen was somewhat enlarged and very adherent. In spite, however, of the difficulty of the operation, there was no excessive bleeding after the spleen had been removed. Sutures were necessary along the edge of the stomach and the tail of the pancreas. The gallbladder appeared to be normal, and the liver was somewhat congested. The spleen weighed 210 gm. The number of platelets in the blood from the splenic vein was 48,000, but the accuracy of the count cannot be estimated. The extract from splenic puncture showed large numbers of platelets.

Six hours after splenectomy the patient's platelet count was 202,000, whereas before operation it had ranged from 40,000 to 80,000, and the bleeding time was normal. Platelet counts made every second day varied from 175,000 to 727,000. Sixteen days after operation the count was 365,000; coagulation time by the Boggs method six minutes; the bleeding time, which had always been prolonged before operation, two and one-half minutes, and the prothrombin time, which had likewise been constantly prolonged before operation, normal. Slight uterine oozing occurred on the third and fourth days but not afterward. There had been no evidence of bleeding from the nose and gums, and the petechiæ had all disappeared. Six weeks after operation there had been no recurrence of bleeding; the hemo-

globin was 68 per cent, and the erythrocytes numbered 4,000,000.

Twenty months after operation the patient was in good general health. There had been no recurrence of bleeding or petechiæ. There may have been a slight persistence of anemia. On the other hand, the patient has never been robust, but is nevertheless able to care for her household, including two children. A recent blood count has not been obtained.

Comment.—This case is an example of a very severe form of the disease; at least twice during its observation death would not have been unexpected. Recuperation, however, occurred on transfusion, and it was later possible to proceed with splenectomy even though the patient was in very poor general condition, and was exhausted as a result of long continued, severe illness. It is a common experience to lose patients in cases of this type, and previous to the adoption of splenectomy in the Clinic, two or three patients with severe hemorrhagic purpura died each year.

While the patient in Case 1 is not naturally robust, she has, nevertheless, been entirely free from bleeding since operation, now twenty months, and is able to do her housework.

Case 2.—A girl, aged twenty-three years, was admitted to the Clinic June 12, 1923, on account of excessive menstruation. She had no knowledge of bleeders in the family. She had evidently had purpuric spots on slight injury from the age of ten. Menstruation began at fifteen and was quite regular every twenty-six days, although definitely excessive until the summer of 1918 when she menstruated every two weeks for six or seven days, losing a large amount of blood and passing clots. She was in bed for five months in 1918 on account of anemia and loss of blood. For the last two years menstruation occurred every twenty-six days, but was excessively profuse. Since puberty there had been frequent petechiæ and purpuric areas, and scratches and cuts had bled freely; nosebleeds had been frequent and severe from the age of fifteen to nineteen.

The patient was pale. The hemoglobin was 54 per cent; erythrocytes numbered 3,370,000, and leukocytes 7,200. The differential count showed lymphocytes 20.0, large mononuclears 3.0, transitionals 3.0, neutrophils 72.0, eosinophils 0.5, basophils 1.5, anisocytosis slight, poikilocytosis slight, platelets 116,000; coagulation time (Boggs) five minutes, coagulation time (Lee) six minutes, bleeding time twenty-two minutes, prothrombin time normal. The spleen was palpable. June 25, the platelets were 100,000, and bleeding time one hour; clot retraction was fairly satisfactory at the end of six hours; the tourniquet test was positive. Subsequent platelet counts were 54,000, 56,000, and 64,000. June 20, a transfusion of 300 c.c. of blood by direct method was given without reaction. July 31, a tooth was resected for periapical infection; a considerable amount of oozing continued for a week. During August the platelet count was persistently low, varying from 28,000 to 76,000. September 1, infected tonsils were removed; there was very little

bleeding for several days, when rather free continuous oozing occurred. Transfusions were given again September 13 and 18, 500 c.c. each, by the citrate method. September 20, the platelets were 136,000, the hemoglobin 56 per cent, the erythrocytes numbered 3,320,000, leukocytes 8,800, coagulation time (Boggs) five minutes, and bleeding time eighteen minutes.

The patient went home for several weeks and returned October 27. She had been feeling a little better since tonsillectomy, but profuse menstruation continued without intermenstrual bleeding. Petechiæ and purpura were present and the spleen was palpable. The hemoglobin was 55 per cent, erythrocytes numbered 4,430,000, leukocytes 8,800, platelets 62,000, coagulation time (Boggs) five and one-half minutes, and bleeding time six and one-half minutes.

Splenectomy was performed October 29 (W. J. Mayo). There was considerable oozing from the smaller vessels but no more hemorrhage than ordinarily occurs from the larger vessels. The spleen was three times normal in size and weighed 200 gm. A post-operative transfusion was given.

Five hours after operation the platelet count was 86,000, and the next day 146,000. On the sixth day it was 638,000, after which a gradual reduction occurred. The bleeding time fell promptly to two and one-half minutes and the coagulation time was normal. Convalescence was uneventful; all bleeding ceased. November 14, sixteen days after splenectomy, the hemoglobin was 58 per cent; erythrocytes numbered 4,990,000, and leukocytes 12,700. The differential count showed nothing of importance; the platelet count was 214,000, and the bleeding time four minutes.

May 7, 1924, five and one-half months after operation, the blood count was normal, aside from a leukocyte count of 10,100. The platelets were 150,000; the bleeding time was one and one-half minutes. November 1, one year after operation, the patient was apparently in good health, and had been working steadily for about six months. During the early part of November she was vaccinated. Six days later she became ill with fever, chills, and a very sore arm, without, however, apparent secondary infection. This illness lasted for about three days. The day following onset a few petechiæ on the forearms and around the neck, and a small purpuric area on the leg, were noticed. These disappeared promptly and did not recur. There had been no excessive menstruation. January 1, 1925, fourteen months after operation, the patient was well.

Comment.—The occurrence of a small crop of petechiæ one year following splenectomy after a chill and fever accompanying vaccination is the only instance of this association either in this series of cases or in those reported in the literature. In one of the series, and in two cases from the literature, there was a slight recurrence following a severe cold, only to subside promptly. It may possibly indicate a specific type of infection which is sufficiently severe during acute exacerbations to cause a recurrence of the purpura in spite of improvement caused by splenectomy. The pathologic appearance of the splenic tissue in purpura hemorrhagica is indicative of an acute spleni-

tis, and would be in keeping with this suggestion of an infectious origin, as would also the improvement in mild cases, which is so frequently seen in children following tonsillectomy.

Case 3.—A man, aged twenty-four years, was first seen January 9, 1920. His family history was negative for evidence of hemorrhagic disease. Since the age of twelve he had had severe nosebleeds several times a year. There had been slight oozing from the gums almost continuously, and the gums bled with the slightest trauma; petechiæ appeared frequently. Two months before examination, he had had a very severe nosebleed resulting in marked anemia. The hemoglobin was 43 per cent; erythrocytes numbered 3,770,000, and leukocytes 5,000; the differential count showed 68 per cent neutrophils, 23 per cent small lymphocytes, 6 per cent large lymphocytes, 2 per cent eosinophils, and 1 per cent basophils. The platelet count was 38,000; the coagulation time by the Boggs method was five minutes, and by the Lee method five and one-half minutes. The bleeding time was forty minutes, and the prothrombin time was slightly prolonged. The patient was very weak and ill. A systolic murmur was present at the base of the heart, and the pulse was somewhat suggestive of the Corrigan type. The first Wassermann test was positive, but a thorough investigation for syphilis, including a provocative series, was negative. The spleen was not palpable.

One transfusion was given, and by April the blood count was quite satisfactory. Another severe nosebleed then reduced the hemoglobin from 63 to 43 per cent, and the erythrocytes from 4,190,000 to 3,650,000. Again there was gradual improvement.

The patient visited the Clinic again in July, 1921; his general condition was greatly improved, although he still complained of oozing from the gums, petechial eruptions, purpura, and prolonged bleeding from cuts caused by shaving. His hemoglobin was 66 per cent, erythrocytes 4,860,000, and leukocytes 5,100. The platelets were 284,000, but in spite of this the bleeding time was very much prolonged, thirty-three minutes. The coagulation time by the Boggs method was six and one-half minutes, and by the Lee method, seven minutes. The prothrombin time was slightly prolonged. The spleen was not palpable. The tonsils were infected, but tonsillectomy was not undertaken.

At our request, the patient again returned February 6, 1924. He had had no very severe attacks of hemorrhage but was afraid to exert himself because of recurrent petechial eruptions and oozing from the gums. Various readings of the platelet count were as follows: 182,000, 72,000, 94,000, 102,000, 84,000, 172,000, and 260,000. A tourniquet test was positive and the clot was nonretractile. Hemoglobin and erythrocytes were normal; the leukocytes numbered 7,000. Coagulation time by the Boggs method varied from six to nine minutes, and by the Lee method was eleven minutes. The bleeding time on five successive tests was normal except once, when it was twenty minutes. Prothrombin time was quite definitely prolonged. A fragility test gave a normal reading. The spleen, at this time, was not palpable but there was a slight tenderness on palpation in the region around it. Although the patient was in very good general condition, the hemorrhagic manifesta-

tions not extreme, and the coagulation factors not markedly disturbed, splenectomy was decided on because of the former history of recurrent attacks of severe hemorrhage over a period of twelve years.

Splenectomy was performed February 22, 1924 (C. H. Mayo). The smaller vessels oozed quite noticeably during the operation until after the spleen had been removed, when all bleeding ceased. The continuous bleeding from the gums ceased entirely after operation. On the fifth day there was slight oozing from the nostrils but after that time there was no bleeding whatever. The petechial eruption, which was present at the time of the operation, gradually disappeared. Two weeks after splenectomy the platelet count was 260,000, coagulation time by the Boggs method nine and one-half minutes, and bleeding time two minutes. The spleen weighed 220 gm. There was no recurrence of bleeding, and ten months after operation the patient was well and working regularly.

Comment.—The patient in this case had had recurrent bleeding for twelve years. At the time of operation his general condition was very good, but the bleeding was somewhat troublesome and partially incapacitated him for work. The spleen was not palpable. The demonstration, therefore, of apparent cure in a case in which the spleen was not palpable and in which the symptoms were mild at the time of operation, is important. The spleen was found to be only slightly enlarged, 220 gm. This is the only case of the series in which an estimation of the fragility of the erythrocytes was made; the readings were normal.

Case 4.—A girl, aged eleven years, came to the Clinic March 11, 1924, because of epistaxis. The family history was negative. A history of hemorrhagic disease was not obtained. The patient's infancy had been normal. She had had measles with pneumonia at two, whooping cough at four, influenza at five, and chicken pox at nine. Six months after influenza, or five and one-half years before examination, she began to have frequent nosebleeds. Petechiæ and purpuric spots were noted at about the same time. She would bleed every week, often for as long as thirty minutes. The tonsils had been removed four years before, without excessive bleeding. Three years previously she had been in the hospital for seven weeks and was transfused. She had a right otitis media at about the same time. Teeth had been extracted one year before, without excessive bleeding. Aside from the epistaxis, petechiæ, and purpura, there had been no bleeding. At the time of admission she was having nosebleeds two or three times a week.

On examination the child was overweight, weighing 92 pounds; a few petechial hemorrhages and purpuric areas were present; there was an area of purpura on the hard palate. The hemoglobin by the Dare method was 56 per cent; erythrocytes numbered 3,480,000, and leukocytes 9,800. The differential count showed lymphocytes 38.0 per cent, large mononuclears 1.5 per cent, transitionals 4.0 per cent, neutrophils 55.0 per cent, eosinophils 1.0 per cent, basophils 0.5 per cent, anisocytosis slight, poikilocytosis slight, and

polychromatophilia slight. Three platelet counts varied from 46,000 to 54,000. The coagulation test by the Boggs method was five minutes, and by the Lee method fourteen minutes. The bleeding time varied from thirty-eight minutes to one hour. The prothrombin test showed no coagulation in six hours and there was retractility of the clot. A tourniquet test was positive. The spleen was easily palpable.

The patient was given a transfusion March 18, 1924, and splenectomy was performed March 19 (C. H. Mayo). The spleen weighed 168 gm. The platelet count rose the day after operation to 100,000, and the bleeding time fell to eight minutes. The third day the platelet count was 98,000 and the bleeding time was five minutes. The fourth day the platelet count was 258,000, the fifth day 430,000, and the sixth day 208,000, while the bleeding time had become reduced to two and one-half minutes. On the seventh day the prothrombin time was still prolonged, no coagulation occurring at the end of two hours; retractility of the clot was still absent at the end of two hours. The patient had nosebleed the second day after operation, but none subsequently up to the time of dismissal, three weeks after operation, and the petechiæ and purpura had disappeared. The platelet count three weeks after operation had fallen to 50,000; the prothrombin time had become normal.

The patient caught cold on her way home and from four to six weeks after splenectomy had a few slight nosebleeds, and a few petechiæ appeared. These promptly ceased. Nine months after operation the patient had had no recurrence of bleeding, and was in excellent health.

Comment.—This case demonstrates the good effect of splenectomy in a girl, aged eleven, who had symptoms for over five years. Epistaxis was the principal type of bleeding. It will be noted that slight nosebleed was present for two or three days, and again a month after operation after catching cold; the nosebleeds were accompanied by a petechial eruption. However, the nosebleed ceased and the petechiæ promptly cleared up and had not recurred nine months later.

PATHOLOGIC PICTURE OF EXTIRPATED SPLEENS (MACCARTY)

Case 1, weight of spleen 210 gm. The gross appearance was not abnormal except for a slight increase in size and weight. The microscopic examination revealed the presence of the normal structures of the spleen. Changes were not visible in the malpighian corpuscles, the reticulum, the cells of the sinusoids or venules, the blood vessels, muscular trabeculæ, capsule or pulp. An increase in the number of neutrophilic leukocytes in the splenic pulp was a prominent feature. A moderate amount of brown pigment was present. A neutrophilic myelocyte was occasionally found; the germ centers were apparently active.

Case 2, weight of spleen 200 gm. The gross appearance was not different from that of the normal spleen. As in Case 1, nothing of an abnormal character was recognizable with the exception of an increase in the number of neutrophilic leukocytes; more than 50 leukocytes were seen in a

single oil immersion field, and several eosinophilic myelocytes were found. A small amount of brownish pigment was present in the pulp; the germ centers were apparently active.

Case 3, weight of spleen 220 gm. The spleen was grossly and microscopically normal with the exception of an increase in the number of neutrophilic leukocytes. In this case, also, numerous eosinophilic leukocytes were present.

Case 4, weight of spleen 168 gm. This spleen was not distinguishable from a normal one except that the blood vessels in the malpighian corpuscles were hyalinized. Some pigment was present but no more than is sometimes found in the normal spleen. There was, perhaps, an increase in the number of neutrophilic leukocytes.

DISCUSSION

It is not necessary to review in detail the features of hemorrhagic purpura, or essential thrombocytopenia, as exemplified in these cases. My own experience with splenectomy for purpura hemorrhagica leads me to conclude with a fair degree of certainty that the procedure is a curative measure. There is a very definite consentaneity between the results obtained in this series and those which have been reported in the literature, now numbering more than twenty.

Several points, however, may be mentioned. The platelet count is not at all times below 100,000 in severe cases of hemorrhagic purpura. There may be periods, usually of only a day or two, during which the count will return to normal. The platelet level as a whole, however, when numerous counts are taken, will be found to be low. The platelet count after splenectomy is not at all times above 100,000, but the platelet level as a whole probably remains higher than before splenectomy. More platelet counts over longer periods after operation are necessary to demonstrate this fact definitely. A low platelet count not infrequently occurs after splenectomy without the recurrence of bleeding.

A study of the platelets is important, especially with regard to the morphologic and chemical abnormalities present in purpura hemorrhagica. Numerically it has been demonstrated that in normal dogs the number of platelets in the blood of the splenic vein is not less than in that of the splenic artery; the platelet count has been reported to be low in the blood from the splenic vein in cases of hemorrhagic purpura, although the accuracy of the observation can be questioned because of difficulties of technic. The number of platelets in venous blood from various parts of the

body of the normal dog seems to be slightly higher than in arterial blood.⁵

The presence of an abnormally large number of neutrophilic polymorphonuclear leukocytes in the spleen is apparently the outstanding feature, from a pathologic standpoint, of purpura hemorrhagica, and it would seem permissible to say that the splenomegaly of this disease is in reality an acute or subacute splenitis.

Severe respiratory infections following splenectomy have, in a few instances, been accompanied by a slight recurrence of bleeding. In one case the reaction accompanying vaccination was apparently responsible for a petechial eruption one year after splenectomy.

Frank, in 1915, suggested that hemorrhagic purpura and acute aplastic anemia might be manifestations of the same disease, in one instance the production of platelets being chiefly affected, in the other a complete aplasia of the bone marrow being present. This conclusion does not, however, appear to be logical in view of the evidence which points to increased destruction of platelets in hemorrhagic purpura, either within the spleen or partly as a result of abnormal splenic function, and the absence of evidence pointing to permanent damage to the bone marrow. The very prompt rise in the platelet count after splenectomy would seem to preclude serious depression of the function of the bone marrow. Indeed it is more likely that hemorrhagic purpura and acute aplastic anemia are fundamentally as different as hemolytic jaundice and pernicious anemia; and that there may be present a condition of the platelets in hemorrhagic purpura which is analogous to the increased fragility of the erythrocytes in hemolytic jaundice.

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DISCUSSION

DR. J. P. SCHNEIDER (Minneapolis): Mr. Chairman—We owe a great deal to Dr. Giffin's masterly summing up of the main features of this condition and presenting the results obtained by splenectomy in particularly the chronic type of this disease. Personally, I am quite in doubt about the efficiency of splenectomy, for, to quote Josh Billings, it would seem "better to know less than to know so many things that ain't so"—about purpura.

In the first place, our present methods of determining the bleeding and coagulation time are full of pitfalls and errors, as can be well appreciated from the multiplicity of methods, all wanting in accuracy or filled with neglected factors. It is much safer to make the diagnosis of idiopathic purpura by clinical judgment than to place dependence upon laboratory tests too freely.

Brill's two cases splenectomized in 1922 and published in 1923, aroused considerable interest and led to calling the type thrombocytopenic purpura—to my idea a misnomer.

In reviewing the literature, I find that five patients have been reported as having had recurrences of bleeding. The following should be considered as points against splenectomy:

1. Both bleeding and coagulation time are influenced by as yet undiscovered factors—to witness, sodium citrate prevents blood from clotting in vitro; in vivo, it hastens coagulation shortly after introduced and drives platelets out of blood stream, followed by liberation of much enzyme.

2. In one of Brill's cases, during delivery of the spleen, the bleeding time was reduced from ten minutes just before the operation to two minutes—as a matter of fact, it was shorter immediately after operation than any time during the subsequent six months' observation. This phenomenon is, to my mind, of great significance, for it means the squeezing out into circulation of cytozyme, which acts on capillaries and influences their contractility, to say nothing of the pituitrin liberated by the surgical shock, which is a potent factor, as demonstrated by Kroch. The liberation is so rapid that the theory of the spleen being a factor *per se*, cannot well hold.

3. Most significant is the work of Bernhard and others, showing that if the splenic area after splenectomy in a spleenless patient is given deep roentgenotherapy, the same qualitative effect can be produced on the hastening of coagulation and lessening of hemorrhage as results from radiating the spleen. How do the proponents of the splenic theory explain that? Nor is that all, for radiating the lymph glands of the neck or mediastinum or merely removing the tonsils or adenoids will produce qualitatively the same favorable temporary result.

4. The platelet count very frequently, in x-rayed or splenectomized cases, returns to below normal, and yet clinically the patients are not bleeding.

The injury in purpura is toxic and not limited to one organ, but a reticulo-endothelial system injury involves, in some instances, a thrombopenia, particularly in the chronic case.

DR. MOSES BARRON (Minneapolis): There is an interesting form of purpura hemorrhagica which is very serious and frequently rapidly fatal. This form affects nursing women.

Dr. Giffin has spoken of the treatment of chronic cases. I would like to inquire whether he would advise operation for the more acute forms. I wish to emphasize what has been said relative to the importance of making a correct diagnosis. I saw a case very recently which was diagnosed purpura hemorrhagica which at autopsy proved to be a case of aplastic anemia. We must not undertake too lightly the operation of removing the spleen if we are to get results as successful as those reported by Dr. Giffin. Cases for operation must be chosen very carefully.

DR. GIFFIN (Rochester): I am very grateful for this excellent discussion. Patients with menorrhagia are regularly examined for evidences of hemorrhagic purpura. It is necessary, of course, in the diagnosis of hemorrhagic purpura to be certain that local conditions are not present in the pelvis which may be the cause of hemorrhage.

The differential diagnosis of hemorrhagic purpura from aplastic anemia is important in connection with splenectomy. We performed splenectomy in one case of pernicious anemia of the chronic aplastic type and also in one case of acute aplastic anemia without benefit. Patients with acute aplastic anemia show a persistent leukopenia in addition to the hemorrhagic features and coagulation factors which might be confused with hemorrhagic purpura.

The spleen has not been enlarged in all of the cases that have so far been operated upon. The absence of a palpable spleen in the presence of definite features of hemorrhagic purpura would not be a contraindication to splenectomy.

Although we have no accurate data concerning the platelet level over a long period of time after splenectomy, the data which we have indicate that it will prove to be high with occasional dips below normal; whereas preceding operation the platelet count is low with occasional elevations to normal or above normal. There seems to be a period of adjustment after operation. Some of the cases show a slight recurrence of symptoms for several days immediately following operation and may also show slight hemorrhagic features following acute infections. It has been known that the platelet count rises after various

operations, including splenectomy for other conditions, but this rise, I believe, has been much less marked than that seen in cases of hemorrhagic purpura.

Radiotherapy has had only slight temporary effect in cases of hemorrhagic purpura. There has been no experience so far with the very acute cases of hemorrhagic purpura; the cases that have been operated on have been either mild cases of long duration or cases of a chronic remittent type. Absolute rest and, as far as possible, absolute quiet in bed are most important in the preparation of patients for operation. The least exertion frequently brings on bleeding. Transfusions have been given to bring the blood up to 3,000,000 or 3,500,000 cells and splenectomy has then been undertaken.

From the standpoint of the general practitioner the diagnosis of hemorrhagic purpura is not necessarily difficult. In the absence of a family history which might indicate hemophilia and in the presence of a history of recurring petechiae, purpura, bleeding from the mucous membranes, and menorrhagia over a period of years, the finding of a prolonged bleeding time upon clean-cut puncture of the ear is sufficient to make the diagnosis almost certain.

THE MOLLGAARD METHOD IN TUBERCULOSIS

The recently published book by Mollgaard and his collaborators on the new gold treatment of tuberculosis gives the properties of "Sanocrysin," which is sodium aurothio-sulphate, and the animal experiments which have been carried out. The serum from calves previously injected with killed tubercle bacilli and tuberculin, which is used in connection with the gold salt, is regarded as an antitoxic serum that neutralizes toxins liberated in the tuberculous animal by the action of the drug. Tests are reported on the effects of "Sanocrysin" and serum in calves injected intravenously with bovine tubercle bacilli. The results are said to be favorable, but the evidence is not convincing. The clinical reports in the book reveal that the treatment is of no value in miliary tuberculosis or in tuberculosis leptomeningitis and that in advanced and serious cases of pulmonary tuberculosis the treatment is perilous and offers "only a slight chance of recovery." It remains to be determined whether any better results can be obtained with the Sanocrysin-serum treatment than without it. There does not appear to be any reason for imagining that the particular gold salt used by Mollgaard can have any different effect than the other gold salts which have been investigated in the past and abandoned. At present there is no justification for rushing into the treatment of tuberculosis with this drug. (*Jour. A. M. A., Feb. 14, 1925, p. 516.*)

THE DICK TEST

The U. S. Treasury Department has not authorized the interstate sale of any Dick scarlet fever preparation. The Council on Pharmacy and Chemistry does not accept biologic products until they are licensed by the Treasury Department, and therefore has not considered the Dick scarlet fever preparation. (*Jour. A. M. A., Feb. 28, 1925, p. 699.*)

THYROID ENLARGEMENT IN MINNEAPOLIS CHILDREN

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The development of a scientific, practical and effective method for the control and prevention of endemic goiter occupies a well established and important position among the recent triumphs in the field of preventive medicine. The adoption of public health measures on a large scale directed toward the prevention of endemic goiter probably is dependent to a considerable extent upon the adequate appreciation of the extent to which the existing conditions constitute a public health problem.

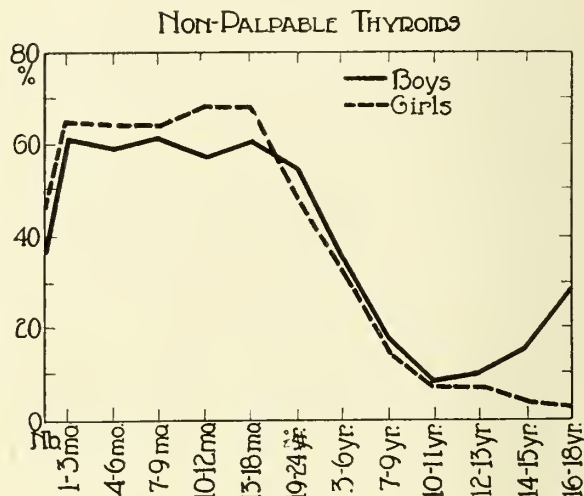


Fig. 1

Studies by Marine and Kimball (1917), Levin (1921), Olesen and Clark (1924) and by numerous others have demonstrated the wide-spread prevalence of endemic goiter in America. In the United States the goiter belt is very extensive (M. Ross, 1924), although within the area the severity and incidence of this condition among the population varies considerably (C. H. Mayo, 1921). Due to this variability, the period at which the employment of prophylactic measures should be instituted probably depends to some extent upon local conditions. A study of the prevalence of thyroid enlargement among 1,906 Minneapolis children ranging from birth to eighteen years of age was undertaken to ascertain not only the incidence of this

condition, but also to elicit if possible some approximate idea as to when prophylactic measures might be instituted most profitably.

In this study the size of the thyroid was estimated by palpation in each case individually. With regard to size, the glands were divided into five groups as follows: (1) non-palpable thyroids; (2) very small or barely palpable thyroids; (3) slightly but definitely enlarged thyroids; (4) considerably enlarged thyroids; and (5) the greatly enlarged thyroids. No attempt was made to classify the enlarged glands as to the type of enlargement present.

The percentage of non-palpable thyroids shows marked changes between the ages of birth and eighteen years, tending to be definitely lower at birth for each sex (Tables I and II) than at any subsequent period up to the age of two years. Between the third and sixth year the number of thyroid glands in this group is distinctly lower than at any previous age. Subsequently this group of undoubtedly normal glands continue to decrease, reaching a minimum percentage value for each sex between the ages of twelve and thirteen. At this period the number of non-palpable thyroid glands has fallen to approximately one-twentieth the number present during the greater part of the first two years of life. After the thirteenth year the percentage of non-palpable thyroids tends to definitely and progressively increase in the case of the boys,

whereas in the case of the girls the non-palpable thyroids continue to be comparatively rarely present at least until the eighteenth year. In addition to this difference noted between the sexes, the averages when smoothed by graphic interpolation (Fig. 1) indicate a slightly higher percentage of thyroid glands belonging to this group

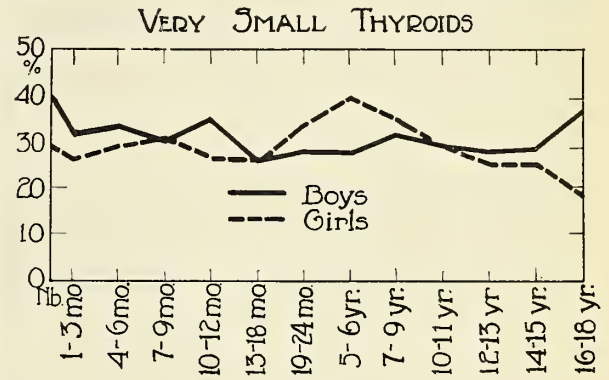


Fig. 2

for the girls during the first two years of life and a slightly lower average thereafter. The marked decrease in the number of non-palpable thyroid glands present after the age of two years strongly indicates that the tendency for thyroid enlargement begins at this early age, which enlargement possibly may not attain proportions sufficient to attract clinical attention as to its prevalence until after a lapse of several years.

TABLE I

BOYS

Table showing age, number of cases and percentage of cases of non-palpable, very small, slightly, considerably and greatly enlarged thyroid glands.

Age	No. of cases	Non-palpable %	Very small %	Slight-ly en-larged		Greatly enlarged %
				ly en-larged %	ably en-larged %	
Newborn ...	49	34.7	42.9	18.4	0.0	2.0
1-3 months..	113	61.9	31.9	3.5	2.7	0.0
4-6 months..	86	60.5	32.6	6.9	0.0	0.0
7-9 months..	91	54.9	36.3	8.8	0.0	0.0
10-12 months	47	68.1	21.3	10.6	0.0	0.0
13-18 months	66	50.0	36.4	13.6	0.0	0.0
19-24 months	63	63.5	20.6	15.9	0.0	0.0
3-6 years....	19	31.6	26.3	42.1	0.0	0.0
7-9 years....	57	10.5	35.1	49.1	5.3	0.0
10-11 years..	57	10.5	33.4	35.1	21.0	0.0
12-13 years..	53	3.6	18.9	49.1	28.4	0.0
14-15 years..	76	14.5	30.3	36.8	18.4	0.0
16-18 years..	66	28.8	36.4	27.2	7.6	0.0

TABLE II

GIRLS

Table showing age, number of cases and percentage of cases of non-palpable, very small, slightly, considerably and greatly enlarged thyroid glands.

Age	No. of cases	Non-palpable %	Very small %	Slight-ly en-larged		Greatly enlarged %
				ly en-larged %	ably en-larged %	
Newborn ...	45	44.7	28.9	23.7	2.0	2.7
1-3 months..	88	64.8	26.1	9.1	0.0	0.0
4-6 months..	82	65.9	26.8	7.3	0.0	0.0
7-9 months..	77	61.0	33.8	5.2	0.0	0.0
10-12 months	43	65.1	30.2	4.7	0.0	0.0
13-18 months	53	75.5	15.1	7.5	1.9	0.0
19-24 months	56	64.3	32.1	3.6	0.0	0.0
3-6 years....	13	23.1	53.8	15.4	7.7	0.0
7-9 years....	54	7.4	31.5	48.2	12.9	0.0
10-11 years..	55	12.7	18.2	45.5	21.8	1.8
12-13 years..	76	2.6	36.8	38.2	22.4	0.0
14-15 years..	266	6.8	21.8	37.6	30.8	3.0
16-18 years..	155	3.2	18.1	44.5	31.6	2.6

The percentage of very small thyroid glands while fluctuating considerably at different ages shows no general trend or change with increasing age (Tables I and II). There is also no constant difference noted between the two sexes.

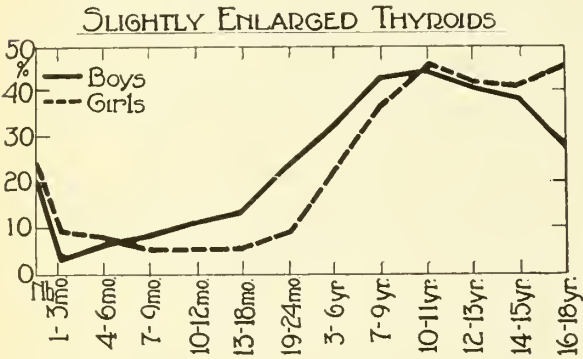


Fig. 3

Slight but definite enlargement of the thyroid is apparently more prevalent at birth than at any subsequent period during the first two years of life, this being particularly true in the case of the girls (Tables I and II, Fig. 3). After the second year for the girls and possibly earlier for the boys, the percentage of slightly enlarged thyroid glands steadily increases, reaching a maximum of incidence between the tenth and eleventh year (Fig. 3 curves smoothed by graphic interpolation). Subsequently the percentage of slightly enlarged thyroids apparently decreases for the boys, whereas for the girls the prevalence of this type of enlargement appears to be more persistent.

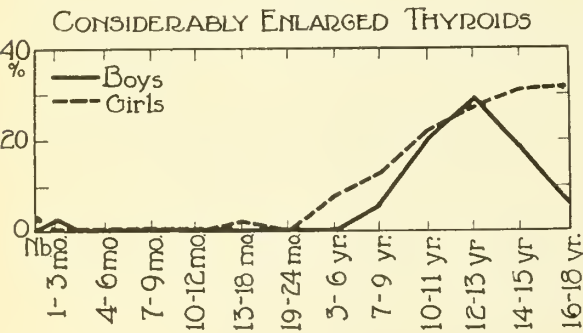


Fig. 4

Thyroid glands classed as considerably or markedly enlarged were found in 2 per cent of the newborn girls and 2.7 per cent of the boys between one and three months of age. Thereafter thyroids of this type were not encountered during the first

two years of life aside from a single instance of a girl baby, 16 months of age. For the boys, thyroid glands that were considerably enlarged reappeared between the ages of seven and nine years, being present in 5.3 per cent of cases at this period. Subsequently this type and degree of enlargement progressively increased, reaching a maximum incidence of 23.4 per cent (Table I) between the twelfth and thirteenth years, and subsequently decreased, averaging 7.6 per cent between 16 and 18 years of age. In the case of the girls thyroid glands showing considerable or marked enlargement were present in 7.7 per cent of cases between the third and sixth year (Table II). With advancing age the percentage of glands classified in this group steadily increased, reaching an incidence of 31.6 per cent between the ages of 16 and 18. The continued greater prevalence of considerable enlargement of the thyroid in girls as compared with boys after the thirteenth year is well shown in Figure 4.

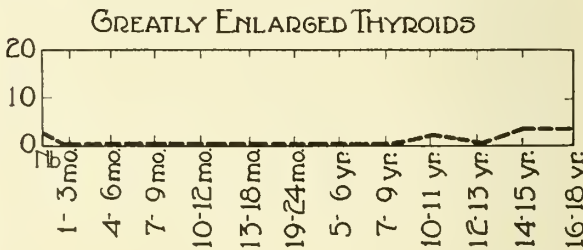


Fig. 5

A greatly or enormously enlarged thyroid gland was found in only one male baby at birth and at no subsequent periods. This degree of thyroid enlargement was also found in one individual case among the newborn girls examined, but subsequently was entirely absent until between the ages of ten and eleven years. Also between the fourteenth and the eighteenth years a few examples of this type of enlargement were encountered, but at no period was its incidence very high (maximum 3.0 per cent at fourteen to fifteen years, Table II, Fig. 5).

In order to obtain a clearer conception of the prevalence of thyroid enlargement of clinical significance at various ages the data were averaged, combining the percentages of non-palpable and of the very small thyroid for each age group (sexes separated) under the assumption that the thyroids of these groups were essentially normal. The per-

centage of thyroid glands classified as slightly enlarged, considerably enlarged, and greatly enlarged were likewise averaged for each age group (sexes separated) and were considered as representing glands which presented enlargement of clinical significance. The results obtained by this combination of data are represented graphically in Figures 6 and 7. The figures show a prevalence of thyroid enlargement in more than 20 per cent of cases

for each sex about the age of puberty. Subsequently these non-palpable glands are found with increasing frequency among the boys, but continue to be rarely present among the girls at least until the eighteenth year.

The percentage of very small thyroid glands fluctuates considerably during childhood, but shows no general trend with increasing age.

Slight and considerable enlargements are more prevalent at birth than at other periods during infancy. After the third year these types of enlargement increase in frequency, reaching a maximum about the age of puberty. The considerable enlargement is apparently more persistent among the girls after this period than among the boys.

At no period of life was great enlargement of the thyroid gland as prevalent as hypertrophies of lesser degree. This type of enlargement is very occasionally found in infancy, and subsequently its occurrence is limited practically to girls about the time of puberty or later.

Since the administration of iodine is more efficient in the prevention than in the cure of simple goiter, the prophylactic treatment of this condition

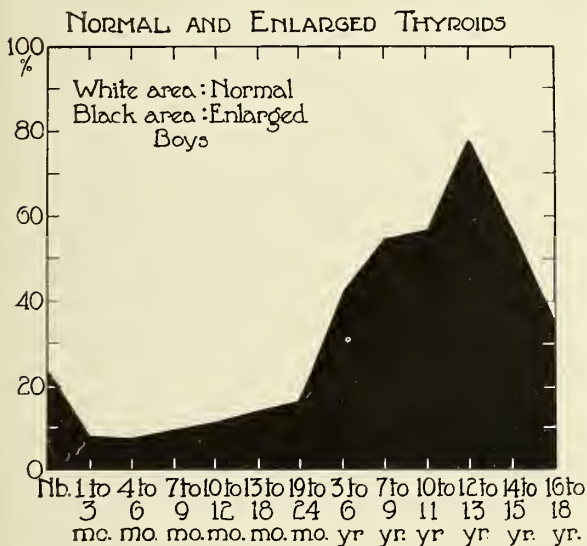


Fig. 6

at birth, the incidence being higher at this than at any subsequent period during the first two years of life. Later the prevalence of thyroid enlargement increases enormously. After the age of twelve to thirteen years, however, this condition apparently occurs with decreasing frequency only among the boys. Inspection of the data (Tables I and II) show that the thyroid enlargement present during early childhood consists for the most part in slight enlargement. Considerable or great enlargement of the gland is not prevalent to any considerable degree until after the seventh year. At all periods of life, however, slight hypertrophy of the thyroid gland is more common than the more marked degrees of hypertrophy.

CONCLUSIONS AND SUMMARY

The percentage of thyroid glands classed as non-palpable is definitely lower at birth than at any subsequent period during the first two years of life. After the third to sixth year of age this group of undoubtedly normal thyroids progressively decreases, reaching a minimum percentage incidence

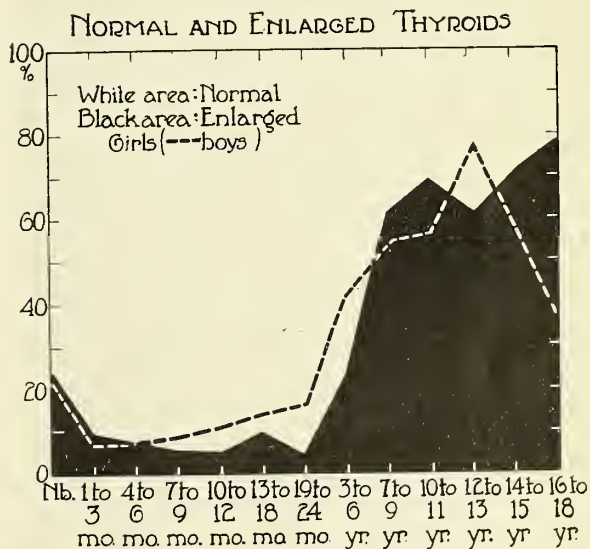


Fig. 7

probably should be instituted rather early in life, preferably before even slight enlargements of the gland make their appearance in any considerable percentage of cases. Simple goiter in children probably can be almost completely eradicated if iodine is administered to mothers during the latter part of pregnancy and to children during each year after the ages of three to six until puberty.

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VALERIAN OMITTED FROM USEFUL DRUGS AND AMYL VALERATE OMITTED FROM N. N. R.

The Council on Pharmacy and Chemistry reports that for some years it has been viewing the claims for the therapeutic value of valerian and valerian preparations and substitutes with increasing skepticism. During the period 1915 to 1921, the Council questioned the claims made for a number of proprietary valerian preparations then in New and Non-official Remedies. In the end these products were omitted because they were off the market. Valerian has been retained in Useful Drugs because it is used to a considerable extent. This use, however, appears to be based on tradition. The Council reached the conclusion that there is no acceptable evidence for the therapeutic usefulness of valerian or the valerian substitutes now on the market. It, therefore, decided (1) to omit valerian from Useful Drugs; (2) to omit the general article "Valeric Esters" along with amyl valerate (the only preparation now in the book) from New and Non-official Remedies, and (3) to admit to New and Non-official Remedies no preparation which depends on valerian or its constituents unless satisfactory new evidence for its therapeutic value is submitted. (*Journal A. M. A.*, Dec. 13, 1924, p. 1941.)

BUTYN AND EPINEPHRIN

As a result of animal experiments recently reported by Hirschfelder, Backer and Jennison, "the addition of epinephrin to solutions of cocain and saligenin increases their tendency to cause local edema. This is not the case with procain and butyn." According to New and Non-official Remedies, 1924, the use of butyn for injection anesthesia or for special anesthesia does not appear promising, since its toxicity is materially greater than that of cocain. Butyn is a substitute for cocain in surface anesthesia, as for the eye, nose and throat; it acts through intact mucosa almost as effectively as cocain; solutions of butyn are non-irritant. (*Jour. A. M. A.*, Feb. 28, 1925, p. 699.)

THE RELATIVE MERITS OF THE VARIOUS TREATMENTS OF PEPTIC ULCER*

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Of all diseases within the abdomen, peptic ulcer stands first in the number and variety of treatments which have been suggested for its cure. While many of the methods have been abandoned, there remain a sufficient number of those possessing real merit to create some uncertainty as to their indications. Yet it is on a knowledge of the value of these different methods, and of their correct application, that the best results in the treatment of chronic peptic ulcer depend.

The methods which are worthy of discussion include both medical and surgical procedures. There are many variations in the medical treatment of ulcer, but the basis is essentially the same in all. The surgical procedures of unquestioned merit are: (1) excision alone; (2) excision with gastroduodenostomy; (3) gastro-enterostomy, with or without excision; and (4) partial gastrectomy.

In considering the merits of any treatment for peptic ulcer, it is essential that the very marked distinctions between gastric and duodenal ulcer be kept clearly in mind. The indications for medical treatment depend largely on the situation of the lesion. In chronic gastric ulcer prolonged medical treatment is justified only when surgery is absolutely contraindicated because of the age or the condition of the patient. As a temporary expedient, however, medical treatment may not only be justifiable, but of marked value in improving the condition of those patients who have become bad surgical risks because of repeated hemorrhages, extensive subacute local inflammatory changes, or toxemia from gastric retention. The more familiar we become with the uninterrupted course of chronic gastric ulcer, which is one of progressive disability, the more certain we become of the fact that prolonged medical treatment is never justified if the patient is fit for operation.

In cases of chronic duodenal ulcer such serious objections to medical treatment do not exist, since the symptoms are usually not so severe, the disability so great, nor the danger of fatal complications so marked as in cases of gastric ulcer. Medi-

*Read before the Minnesota State Medical Association, St. Cloud, October 8-10, 1924.

cal treatment of chronic duodenal ulcer is, therefore, not uncommon, but the absence of reliable data concerning the late results of such treatment suggests that the results are not so satisfactory as might be wished. Undoubtedly certain patients are relieved of the symptoms of ulcer under medical treatment, and since post-mortem evidence shows that ulcers may heal spontaneously, most surgeons agree that one thorough course of medical treatment of uncomplicated duodenal ulcer is justifiable before surgical intervention is advised.

The groups of patients with duodenal ulcer who may be treated medically are: (1) patients under twenty-five years of age; (2) patients with mild symptoms of short duration; (3) patients in whom ulcer is found incidentally (in roentgenologic examinations); and (4) patients whose general condition because of age, or because of other disease, makes operation a greater menace than the ulcer.

The question of how long the medical treatment of chronic duodenal ulcer should be persisted in depends largely on the symptomatic response in the individual patient, the economic status, the general health, and the willingness to follow the treatment. If the patient's general condition does not permit operation, the dietary and therapeutic treatment must be continued to some degree indefinitely, but if the patient is in a satisfactory condition for operation, definite failure of the treatment to control the symptoms, or prevent recurrence of attacks, calls for operation. The majority of patients who elect medical treatment return sooner or later with the same experience of alternating periods of relative comfort and distress, regardless of how rigidly they have adhered to treatment. Then, because the treatment has proved too irksome, or because it has failed to control symptoms, they seek more positive measures of relief. The economic status of the patient is an important factor since few patients can afford, or are willing, to give the necessary time to carry out all the details which comprise the modern medical treatment of ulcer. In most cases of chronic duodenal ulcers, therefore, surgical treatment is sooner or later indicated.

Of the surgical procedures at our disposal, each has its merits, the essential point being the selection of the best method in the individual case. Just as it is necessary in discussing the medical treatment of peptic ulcer to distinguish clearly between gastric and duodenal ulcer, so in the surgical

treatment it is equally important to realize that gastric and duodenal ulcer are two distinct entities. It is generally recognized that the fundamental principle in the successful treatment of chronic gastric ulcer is the removal of the ulcer, whenever feasible. The method of removal varies with the size and situation of the ulcer. For small, accessible ulcers, local excision by cautery or knife, combined with gastro-enterostomy, gives excellent immediate and late results, and the procedure is usually both safe and simple. Occasionally, when such a small ulcer is near the pylorus, and the pyloric end of the stomach and the duodenum can be easily mobilized, local excision followed by gastroduodenostomy, or pylorotomy by the Billroth I method, may be employed. In neither the immediate nor late results, however, do these methods show any advantage over excision and gastro-enterostomy, and there are certain inherent disadvantages to plastic operations at the pylorus which may mitigate against the best end-results. For larger ulcers, partial gastrectomy is the operation of choice since it cannot be determined whether or not such ulcers are malignant, and it is well established that all chronic gastric ulcers are potentially malignant. It is probable, therefore, that partial gastrectomy will be more widely employed in the treatment of gastric ulcer in the future, but the prevailing current impression is that the sacrifice of a large part of a normal stomach for a small lesion which can be safely and completely removed by excision does not appear to be justified. Gastro-enterostomy alone should only be done in cases of chronic gastric ulcer in which it is not feasible to remove the lesion. The late results are uncertain, not only because of the indifferent relief of symptoms, but because of the serious danger of malignancy developing in the unremoved lesion. The indications for the various procedures in chronic gastric ulcer are represented by the types of operation performed in the Mayo Clinic during the last ten years. From 1914 to 1924, 1,228 operations for chronic gastric ulcer included: (1) cautery excision and gastro-enterostomy, 342 (27.8 per cent); (2) knife excision and gastro-enterostomy, 237 (19.2 per cent); (3) partial gastrectomy, including Billroth I and II, retrocolic Polya, antecolic Polya, sleeve resection, and so forth, 197 (16.04 per cent); (4) excision and gastroduodenostomy, 29 (2.3 per cent); (5) gastro-enterostomy, 250 (20.3 per cent).

In the surgical treatment of chronic duodenal ulcer, one fact stands out: that no one operation, even when well suited to the individual case, will give perfect results. Because of this fact, surgeons have sought, by constant effort, to improve the results by the modification of old methods, or the introduction of new. Many of these have not withstood the test of time, but there are at present four surgical procedures for chronic duodenal ulcer which should be considered: (1) gastro-enterostomy, with or without excision of the ulcer; (2) pyloroplasty or gastroduodenostomy, with or without excision; (3) excision alone; and (4) partial gastrectomy.

The merits of gastro-enterostomy for chronic duodenal ulcer can be judged by its long-standing popularity. It was on the results of this operation that the surgical treatment of peptic ulcer became firmly established. Much of the recent criticism of gastro-enterostomy has been unfair, since it has to a large extent been based on failures due to the abuse of the operation rather than on the good results following its proper performance in cases in which adequate indications existed. In suitable cases satisfactory results can be anticipated in more than 90 per cent.

I recently reviewed 1,000 cases of chronic duodenal ulcer in which gastro-enterostomy had been performed more than ten years before, and found that 88 per cent of the patients reported satisfactory relief from their ulcer symptoms. The operation is safe, the mortality rate being between 1 and 2 per cent; it is usually simple, and it can often be done when any other procedure is definitely contraindicated. These facts explain its wide application. Of 6,665 cases of chronic duodenal ulcer coming to operation in the Mayo Clinic, gastro-enterostomy has been performed in 5,755 (86.35 per cent).

To attain the best results from gastro-enterostomy, a safe principle to follow is that the more extensive the lesion, the more definitely is the operation indicated, and the more certain are its results. Consequently, it is in cases of long standing that the operation is most effective, particularly when potential or actual obstruction exists. The advisability of removal of the ulcer at the time of gastro-enterostomy must be determined in each case, but the necessity for it is comparatively infrequent. In the Mayo Clinic, excision of the

duodenal ulcer has been done in addition to gastro-enterostomy in only 2.18 per cent of the cases.

Operations at the outlet of the stomach, either those embodying a reconstruction of the pylorus, or a gastroduodenostomy without division of the pylorus, have a definite though limited place in the treatment of chronic duodenal ulcer. Many methods have been devised for carrying out these operations, but it is significant that none has attained widespread use. The results of such operations in the Mayo Clinic have not been so satisfactory as the results of gastro-enterostomy, and they have been performed in selected cases, chiefly when gastro-enterostomy, because of technical obstacles, was inadvisable. Under such circumstances a large pyloroplasty is a useful substitute for gastro-enterostomy. The chief merit of pyloroplasty is that it permits inspection of the mucosa of the duodenum and pyloric end of the stomach. A knowledge that multiple ulcers are present is of value, both from the standpoint of operative procedure and of interpreting disappointments after operation, particularly the recurrence of hemorrhage. The advantage of excision of a duodenal ulcer, which is usually possible with pyloroplasty, is a doubtful one and, in other than exceptional cases such as the bleeding type of ulcer, is not necessary. The chief disadvantage of operations at the outlet of the stomach is that they do not have so positive an effect in reducing the acidity of the gastric juices, or in maintaining that reduction, and since the value of any operation on the stomach is largely determined by its effectiveness in these respects, such a disadvantage is serious. In the 6,665 cases of chronic duodenal ulcers in which operation was performed at the Mayo Clinic, pyloroplasty and gastroduodenostomy were employed in only 4.07 per cent.

A small, non-indurated ulcer of the anterior wall of an easily mobilized duodenum lends itself readily to excision by knife or cautery. In a number of cases of this type of ulcer, in which the symptoms are mild and other disease is present in the abdomen, the ulcer has been excised, the opening closed, and no further operative procedure carried out. Subsequently, the removal of all foci, and dietary treatment are advised. Judd has recently been carrying out local excision more often. This method of treatment would seem ideal because of its simplicity in principle and technic, but since the operation itself cannot protect the patient

against the formation of further ulcers, the end-results are problematic.

The most interesting recent development in gastric surgery has been the advocacy of partial gastrectomy for duodenal ulcer. There seems little reason to believe that this operation will attain much popularity since it necessitates the removal of a large part of normal stomach to relieve a benign condition of the duodenum which can be satisfactorily dealt with by a simple indirect operation in all but a small percentage of cases. The argument that partial gastrectomy obviates the possibility of subsequent ulceration is not absolutely sound, since secondary ulceration may and does occur after partial gastrectomy. Moreover, since the recurrence of ulceration after gastro-enterostomy is only 2 per cent, a routine partial gastrectomy is hardly justifiable to prevent such a slight liability. It seems more reasonable to reserve partial gastrectomy for the exceptional cases of duodenal ulcer in which secondary ulceration does occur. Partial gastrectomy may, however, be amply justified in gastric ulcer.

The relative merits of the different surgical procedures for chronic duodenal ulcer are indicated in the following tabulation, which shows how they were employed in the 6,665 cases at the Mayo Clinic:

Operation	Cases	Per Cent of Total
Gastro-enterostomy	5,755	86.35
Pyloroplasty, gastroduodenostomy	271	4.07
Excision alone	260	3.90
Partial gastrectomy	30	0.45
Miscellaneous	359	5.23

DISCUSSION

DR. A. C. STRACHAUER (Minneapolis): The statistics presented by Dr. Balfour conclusively prove that gastro-enterostomy is an extremely satisfactory operation in the majority of instances when properly performed. One of the principal reasons that it will probably continue to be the mainstay is that in most cases of ulcer of the duodenum it is the only operation which can be performed. Unfortunately, due to the anatomical location of the majority of the ulcers, resection or pyloroplasty, or both, can not be safely performed.

Gastroenterostomy is, indeed, a wonderful operation. It has survived much abuse: poor technique, including unabsorbable suture material, the long loop and the short loop, loops to right and loops to left, the various positions and angles for the opening, including the anterior and posterior, and its performance even in the absence of ulcer, let alone its positive indications.

Gastroenterostomy is performed in the majority of cases because it is the only operation that can be performed, and not because it is the ideal operation. Whenever safely possible, the ulcer, whether in the stomach or duodenum, should be eradicated. Removal alone constitutes actual cure, and obviates the complications of hemorrhage, perforation and malignant degeneration. The practicability of removing the ulcer depends largely on the experience and ability of the surgeon, and no hard and fast rules can be set. As a matter of fact, it is only after the abdomen has been opened that a decision can be made as to the type of procedure indicated in the special case at hand. The case in each instance must be individualized and the surgeon should be thoroughly familiar with the indications and contra-indications and the technique of all of the modern operations. The surgeon of experience can prophesy just about the degree of success and benefit to be derived from a gastroenterostomy in any given case.

There are two indications for gastroenterostomy. One, the presence of the ulcer with obstruction; two, ulcer with hyperacidity, or both. In the case of obstruction the patient is relieved by providing a new opening, so that the stomach can readily empty itself. In the case of the ulcer with hyperacidity the gastroenterostomy opening permits the entrance into the stomach of the alkaline contents of the duodenum, that is the bile, pancreatic juice and Brunner's glands secretion, thus neutralizing in part the hyperacidity present and removing the cause of the pyloric spasm and hypermotility of the pyloric end of the stomach. While these patients are symptomatically cured the ulcer frequently remains unaffected.

In a series of cases of ulcer of the duodenum studied at the University Hospital, 28 per cent had hypoacidity or anacidity. In the absence of obstruction this latter group will not be benefited by gastroenterostomy.

Ulcers of the duodenum and stomach do not give any direct symptoms. All the symptoms are secondary, that is, are due to pylorospasm and the secondary hypermotility of the pyloric end of the stomach. This explains the "silent" ulcer, in which these secondary reflex findings are absent. Under local anesthesia, the injections being limited entirely to the abdominal wall and exclusive of any splanchnic anesthesia, I have incised and cauterized both the stomach and duodenum without the patient experiencing the slightest pain.

In my personal work I am committed to the eradication of the ulcer whenever feasible, considering gastroenterostomy as being both unanatomical and unphysiological. I avoid its performance as much as possible. Surely, the eradication of the ulcer and anatomical restoration at the pylorus, so that the stomach empties into the duodenum as intended, is the ideal we should strive for. In the Horsley operation the same single incision is employed for the resection of the duodenal ulcer and the plastic restoration of the pylorus.

The trouble with gastroenterostomy is that it has been too good an operation, and "the good enough is the worst enemy of the best." This applies, in my opinion and experience, to a definitely limited group of cases which can be better treated by removal of the ulcer with or without pyloroplasty than by gastroenterostomy. There is no ques-

tion but that gastroenterostomy is a very beneficial operation but in many instances it is not the best.

In reviewing a hundred stomach cases which I personally operated upon, I find that of 53 ulcer cases, 21 simple gastroenterostomies were performed, with two operative deaths. Thirty-two resections of the ulcer were performed with two deaths; 13 of these had a pyloroplasty of the Horsley type. In the thirteen Horsley pyloroplasties there were no deaths. Some of the ulcer resections have been secondary to gastroenterostomies performed elsewhere.

In no field of surgery is the individualization of the case at hand more important than in ulcer of the stomach and duodenum.

DR. A. T. MANN (Minneapolis): Dr. Balfour's paper has been exceedingly clear and I for one cannot take exception to anything I find in that paper. I believe it presents to us the practice of the best surgeons of the present day. In other words, it seems to me the paper strikes the target. But it is a movable target and we must keep watching the target. We can expect in the years to come some slight modifications. I think it is possible that there may come some revolutionary modifications; but we cannot foresee them.

Now, in regard to the ulcers, the gastric ulcer and the duodenal ulcer are different. They are different in conditions which accompany them and the organ in which they occur. The duodenal ulcer is more often associated with hyperacidity than is the gastric ulcer. There is a chemical difference, a difference of function. That difference can be measured by the results of the test meals. The charts show that nearly 75 per cent of duodenal ulcers have hyperchlorhydria, and only about 20 per cent of gastric ulcers have hyperchlorhydria.

In regard to the partial resection of the stomach it seems to me that the position Dr. Balfour has taken is the right one. It seems unwise, unnecessary to sacrifice a portion of a normal stomach and remove part of the stomach when the ulcer is in the duodenum. My present feeling is that partial gastrectomy is done and should be done only in cases of ulcer of the stomach, very seldom as a secondary operation with the complications that come with ulcers in the duodenum after a previous operation has been performed. The resection of an ulcer in the stomach probably will give us better results if it is accompanied by a gastroenterostomy. Why that is, we have not been able to explain. Our position comes from a study of results, and there have been quite a number of the gastric ulcers which have been excised without gastroenterostomy in which a new gastric ulcer has formed in the stomach and required a gastroenterostomy later. So that from experience we feel that it is more necessary to do a gastroenterostomy after excision of a gastric ulcer than it is to do a gastroenterostomy after excision of an ulcer of the duodenum.

As to the excision of an ulcer of the duodenum without gastroenterostomy, it seems to me that this should be limited to the cases where the ulcer is comparatively moderate or small in size, and where the closure does not tend to constrict the duodenum or the outlet of the stomach; that is, where the ulcer can be excised and a full passage restored. Even when they are excised a gastroenterostomy should be performed as a rule.

The whole subject is very interesting and it is exceedingly interesting that after all these years we have rested again with so much feeling of security on a gastroenterostomy. It should not always be done but it is our mainstay and it has proven its worth. Many other things could be said, but I think that is enough.

DR. T. L. CHAPMAN (Duluth): It is stabilizing to a large part of the more active of surgeons at this time, to hear so reasonable a voice and one so able, urging conservative surgery in cases of peptic ulcer. The more radical of the German surgeons have so filled much of the late literature with appeal toward the more extravagant resections for comparatively benign lesions, that much doubt has been raised as to whether or not the simpler operations have any longer a position of dignity or security. The statistical value of Dr. Balfour's presentation is very great, and particularly so in relation to the treatment of duodenal ulcer in the large majority of cases by gastroenterostomy. There has been recently so much written and discussed of the shortcomings of this operation, that even experienced stomach surgeons may have felt a faltering in confidence in this, as a standard procedure. Undoubtedly there are various functional disturbances and some further surgical sequelæ as a result of this operation being so generally advocated; but the statistical basis of improvement and safety seems to point conclusively to the operation as excellent treatment, in a great majority of cases.

It is extremely important, it seems to me, that any surgeon undertaking gastro-enteric surgery, should possess himself of the available technique and sequelæ of a large number of types of operation. Individual variations of the disease are so very wide, and the personal equation of operative skill makes it imperative that a change from the usually applied operation be made with facility, if the situation seems to require it. A considerable repertoire of operative shifts must be available, therefore, in all branches of this type of surgery.

We are entirely in accord with the essayist's opinion that gross resections are not required in the usual type of duodenal ulcers. The principle of removal of gastric ulcers plus a gastroenterostomy is certainly correct, and resection of the pyloric portion of the stomach for very large, or for severe pyloric ulcer, has proved its value by the safety of the patient from recurrence, and his subsequent comfort. So much for the standard types encountered; nevertheless it seems to me that any given case may demand a variant from the usual operation, that will satisfy a peculiar necessity of the immediate or future situation of the patient. When a certain type of operation is thought to apply to the given case, actual operative findings at the table will often cause the necessity for applying a very different type of operation. It is knowledge and experience that makes this change of value to the patient and protects his surgeon from the fear that he may have done an ineffective or probably harmful operation.

What has been said regarding certain standard operations as applied to certain types of peptic ulcer is, of course, not unalterable. There are various complications of gastric and upper enteric disease that will entirely warrant the most elaborate and various of surgical resections and plasties, with entire justification. Emphasis is laid in this regard

upon the surgeon's knowledge of the technique of all the accredited types of operation, and his entire understanding of the probable effects in the manner of healing, the probable subsequent function of the affected parts, and the general safety to the patient. When these conditions are complied with, it is felt that proper selection of operative measures may be safely applied.

THE CHAIRMAN (Dr. Hunt): In throwing this paper open for general discussion I think that the principle of free speech should be encouraged. This is a subject of importance not only to the surgeon but to the internist as well. In extending the invitation to the internists I wish to call upon an internist I see here who has had wide experience in treatment of ulcer and has seen many of these patients before and after operation. I have not notified him beforehand but will now, and will call upon Dr. S. Marx White.

DR. S. MARX WHITE (Minneapolis): Thank you for the failure to notify me beforehand; that gives an opportunity to explain my shortcomings in the discussion. I have been extremely edified by the discussion which has been had here and I want to voice first my entire approval of the reaction which has appeared in those discussing the paper and was manifested in Dr. Balfour's presentation of the necessity for a careful selection of the type of operation to be applied. The ease with which gastroenterostomy can be done, the mastering of its technic by a large number of surgeons, has, I feel, led to its application in probably a larger number of cases than it would be applied where the skillful surgeon is the master of all the technic necessary for the various procedures applicable in the individual case. The case in whom resection of the gastric ulcer can be done has too many times been subjected only to gastroenterostomy; and possibly also an attempt at gastric resection, resection of portions of the stomach, has been done where the skill was not sufficient for the application in that particular case.

As an internist, however, the portion of this subject that appeals to me most strongly is the necessity for careful medical treatment beforehand. Dr. Balfour has emphasized the need or the call in most cases for an attempt at medical cure and this certainly should be done because a considerable number of cases are possible of relief over a very long time and sometimes complete relief by medical measures. But more important, as I see it, is the application of medical measures following operation, the application during the period of convalescence of the proper methods of medical treatment and for a long time succeeding. Now, I can appreciate that the surgeon is anxious to demonstrate as effectively as possible the efficacy of the surgical measures, but I believe that when the interest of the patient is taken into account we will realize that we ought to add the application of those principles which we understand of the functions of the stomach for a long period of time at least after operation has been done. Every one of us believes that with the gastroenterostomy, we will say as an illustration, and more particularly with the application of more widespread surgical procedures on the stomach, it takes a long time, it takes many months before that stomach is again readjusted to the new conditions. During that period the patient should have every opportunity for the

best, the fullest, the most complete healing, and as complete physiologic rest and adaptation as can be provided; and the internist is in a position and should be called upon to supply that supervision.

DR. C. M. ROAN (Minneapolis): About six or seven years ago I had an experience which has made me hesitate at times since, as to surgery on the stomach. A man about fifty years of age consulted me and after a careful examination I diagnosed a gastric ulcer and affected appendix. This man subjected himself to operation, and upon opening him I felt that I had made a mistake in diagnosis. I found as mass as large as my fist in the lesser curvature which I, previous to the operation, had diagnosed as ulcer, but at that moment I felt certain it must be a malignancy. It was not a gumma. I took a look at his appendix. It was swollen, congested and badly inflamed, but I said to my assistant, "There is no use removing the appendix from a man who has only a short time to live on account of this carcinoma." I closed him up and told him later I could do very little for him. He was one of these very good patients who remain with his doctor. The only advice I could give him was to eat as little as possible. I do not know just why I gave him that advice. A year or so afterwards I was called to see him. He had a typical attack of acute appendicitis, very severe, and in view of the fact that the man had not lost weight I told him at that time what I had found at operation and that I must have been mistaken as it now seemed necessary to remove his appendix, which I did. At this time I made a high incision and was surprised not only to find the appendix inflamed but also that the mass in the lesser curvature had entirely disappeared. There had been no treatment given him other than starvation. The man is well today.

I want to relate another experience which bears on this topic of stomach surgery. I was called upon about two years ago to see a man who had had a gastroenterostomy performed by an able man. This patient suffered a great deal but particularly from a very bad odor which was like that of rotten eggs. He could not sleep in the same room with his wife on account of this odor. I didn't know what to do with him but finally I came to the conclusion that the best thing would be to detach the gastroenterostomy, which I advised him to have done and which he submitted himself to. I found—and that bears on the point Dr. Strachauer mentioned about gastroenterostomy, that while it is the mainstay it is one of the operations which have been very badly misused—I found that this man had the ilium within three or four inches from the cecum attached to the greater curvature of the stomach, and that the bad odor he had had was due directly from the big bowel. I detached the gastroenterostomy and the man was relieved of the odor, but peculiarly enough his old symptoms of a duodenal ulcer reappeared, and he has those typical symptoms today. I believe this man will have to have a real gastroenterostomy performed yet before he will get well.

DR. D. C. BALFOUR (Rochester): I think this discussion has brought out very clearly two things: that surgeons are more or less agreed as to the treatment of gastric ulcer and are not agreed as to the treatment of duodenal ulcer. That is, in gastric ulcer one recognizes that the lesion should be removed. The method of removal is not of great impor-

tance, although there is an increasing tendency toward partial gastrectomy and I have no doubt that it should be done in a large percentage of cases. When one considers duodenal ulcer, I think the difference of opinion is due to the fact that no one is satisfied with the results in these cases. If a careful selection of cases is made and one does the operation which is indicated, the results are excellent; but, as Doctor Mann has said, the whole question is a movable target because traditions are changing. The very spectacular results which gastro-enterostomy gave in the earlier days of gastric surgery are not so frequently seen now because we are getting quite a different group of patients since the public is spreading the news that the surgical treatment of ulcer is so effective. One may have patients with very mild symptoms and small lesions, and upon exploration find a small stomach. In such cases one cannot get perfect results, and at any event the results are not very definite because the symptoms were not very definite. I think it is in this group that medical treatment is highly advisable; and since the patient is not in a condition serious enough to warrant surgery, the treatment should be prolonged in order to give him every chance to get well.

I think Doctor White's discussion is one of the best that I have ever heard an internist give on this question. I believe that every surgeon would approve of what he said and would emphasize the importance of it.

When one considers the various operations which have been advised, there is one principle which I think should always be kept in mind: that is, to get good results one must have good drainage. No matter what procedure is contemplated in the individual ulcer, good drainage is essential. Once an operation is done on the pylorus or on the greater curve of the stomach, or what not, if one does not get good drainage, one does not get the relief of spasm in the stomach, nor does one secure the regurgitation in the outline of the duodenal loop which is so necessary to a good result in peptic ulcer.

PIXALBOL NOT ACCEPTED FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Pixalbol is the name under which E. Billhuber, Inc., New York, markets a colorless tar preparation which is manufactured by Knoll & Co., Ludwigshafen a. Rh., Germany. It is claimed to be identical with the preparation formerly sold in the United States by Knoll & Co. as Anthrasol. The trademark on the word "Anthrasol" was seized by the U. S. government during the late war and sold to the Chemical Foundation, Inc. The product may be marketed in the United States under the name Anthrasol, only with the consent of the holders of the rights to the trademark. In consideration of the abuses which are connected with the application of proprietary names to medicinal articles, the Council recognizes such names only when this is in the interest of the public welfare. Since the product in question was introduced under the name Anthrasol, the Council decided that it was not in the interest of medicine that further proprietary names be applied to it. The Council informed E. Billhuber, Inc., that consideration will be given the product if it is marketed as Anthrasol under license from the Chemical Foundation, Inc., or under a satisfactory descriptive non-exclusive name. (*Journal A. M. A.*, Nov. 22, 1924, p. 1704.)

ACUTE PERFORATED GASTRIC AND DUODENAL ULCERS*

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Acute perforation of an ulcer of the stomach or duodenum is not an every-day occurrence; nevertheless it is frequent enough to demand our serious consideration. This is especially true because it is a curable condition and its cure depends on its early recognition.

During the past two years eight cases have come under our observation. This number includes only those in which there was no previous manifestation of perforation but in which there was a sudden perforation of an upper abdominal viscus and the contents suddenly poured into the upper peritoneal cavity. In our series of cases, one occurred shortly after breakfast, one in mid-afternoon, three at five in the afternoon, one in bed at ten o'clock at night, demonstrating that an ulcer of the duodenum or stomach may perforate at any time. All of our patients were comparatively healthy males ranging from seventeen to thirty-nine years of age. Two patients were brothers. Four of our patients had been on varied types of previous medical treatment and three were without previous symptoms.

Acute perforations with gross symptoms are, according to our experience, generally located on the anterior side of the stomach or duodenum or at a point easily accessible. If posteriorly located or in a position not easily accessible they are anatomically converted into a localized chronic adhesive perigastritis. We also believe that it is of little import in diagnosis or treatment whether these perforations occur in the stomach or duodenum. All of our cases were anterior perforations and four were in the stomach and four in the duodenum.

The diagnosis of perforation is not made by observing a large number of symptoms or signs but the few symptoms that are present are so striking and definite that a diagnosis in the beginning is not difficult. The two principal and outstanding symptoms are pain and rigidity, the former being evident to the patient, the latter to the examining physician.

The pain is characterized by its suddenness in

*Read before the annual meeting of the Minnesota State Medical Association, St. Cloud, Oct. 8, 1924.

onset and its severity. It is so severe that the patient at once drops any activity in which he is engaged and holds himself in a cramped position fearful of increasing the pain by movement. The pain is continuous and most often not relieved by hypodermics of large doses of morphine.

The second symptom and that most evident to the examiner is rigidity. The abdomen is hard and board-like and retracted, with the margins of the recti muscles plainly visible. This rigidity is seldom released until deep anesthesia is complete. These two symptoms, the sudden excruciating pain in the epigastrium and the board-like rigidity of the abdomen, are in most cases diagnostic of perforation in the upper abdomen.

Vomiting is of little diagnostic value. Other signs, such as dullness, distention, etc., which usually appear late, are of no importance in the early diagnosis and when present are indicative of an extending peritonitis and a bad prognosis. The absence of elevation of pulse and temperature in the early hours is an important point, both in diagnosis and prognosis. When the patient is seen late the rise of pulse and temperature is again indicative of extending intraperitoneal infection and a bad prognosis.

The white blood count is very important to us in confirming diagnosis. Usually at the end of the first hour there is a rise of from two to four thousand above normal and a proportionate rise occurs each hour thereafter.

One case not included in the above series was brought to our office with almost typical perforative symptoms and only after an hourly blood count for five hours without an increase and a gradual release of his abdominal condition did we pass up operative investigation. In spite of the release of his symptoms a continued hourly increase in his white count would have brought him to the operating room.

Shock of varying degrees is present in all cases when seen early and as time continues without interference it is replaced by the evidence of an extending peritonitis.

The treatment of perforation is exclusively surgical and in general consists of excision of the ulcer perforation with a margin sufficient to render the edges pliable enough for suturing. If our observations at operation reveal obstruction to the outlet or a possibility of obstruction developing in the future, the usual posterior gastro-enterostomy is

performed in addition to the repair of the perforation. In four instances we performed gastro-enterostomy.

Our patients presented symptoms of shock at the time of operation and we believe that the surgery indicated, even to the repair of the perforation and gastro-enterostomy, is well borne. Six of our patients made a rapid post-operative recovery. We keep these patients on ulcer management for at least three months after leaving the hospital.

As to drainage, we believe, in patients promptly diagnosed and operated, drainage is not essential. However, in the later cases one may be guided by the amount of intraperitoneal infection.

In none of our patients with acutely perforated ulcers have we felt that the indications for radical resection of large parts of the stomach or duodenum justified the risk of this measure. We have felt that should resection be indicated at some future date our gastro-enterostomy already performed represents an accomplished part of the radical operation.

In the above series of operated cases, one was brought to the hospital and operated sixteen hours after the onset, with all the symptoms of generalized diffuse peritonitis. We felt that although operative investigation was of little avail, the patient might be benefited by closing the perforation and rendering what assistance could be given by drainage. He died eighteen hours after operation. One patient operated eight hours after onset with early manifestation of an extending intraperitoneal infection and upon whom a repair of the perforation and gastro-enterostomy was done, had a stormy convalescence for twenty-four hours immediately post-operative but reacted rapidly thereafter. All of the remaining cases were brought to operation within four hours of the onset.

From the above we might conclude that the success of operative investigation depends entirely on the extent to which the intra-peritoneal infection has advanced and that the safety zone lies somewhere between eight and sixteen hours after the perforation.

The following two records are those of two of the patients of the above series:

CASE No. 25427. E. S., male, aged 23, butcher by trade, taken suddenly at three in the afternoon with a pain in the abdomen that doubled him up. Examination reveals a healthy young male with retracted, board-like abdomen complaining of severe pain. Pulse 60, temperature 97, respiration 28. The skin was cold and moist. The white blood count was 19,000 at the end of one and one-half

hours. He had had a definite diagnosis of duodenal ulcer two years ago.

Under ether anesthesia two and one-half hours after onset, operation revealed a round perforated ulcer at the pylorus. There was little induration of ulcer margins. The opening was closed and a posterior gastro-enterostomy performed. Recovery was uneventful. Ulcer management was instituted for four months post-operative.

It is interesting to note that an acute suppurative appendix was removed nine months later.

CASE No. 26720. J. C., aged 17, male, student, while walking about at 4:30 in the afternoon, was taken suddenly and without previous warning with an acute pain in the upper abdomen which doubled him up so that he was carried home. Examination reveals a boy in acute pain. The skin was cold and moist. The abdomen was of a board-like hardness and retracted and the recti muscles were markedly rigid. Temperature 97.6, pulse, 80-100, respiration 26 and shallow. The white blood count at 6 p. m. was 12,600; at 7 p. m., 14,000.

Operation at 8 p. m., three and one-half hours after onset, revealed a perforation on the anterior wall of the stomach. Resection of the ulcer margin was made with proper closure of the defect. Recovery was rapid and uneventful. He was kept on an ulcer management for three months post-operative.

This patient had no previous history of gastric trouble.

DISCUSSION

DR. H. C. COONEY (Princeton, Minnesota): I wish to compliment Dr. Stangl on his short but excellent paper on this topic. Ulcer of the stomach is something like the poor, we have it always with us. The very important thing about the management of a perforated ulcer of the stomach is to "move our freight" while the moving is good, that is, get into the abdomen early, make a prompt diagnosis if possible, but get into the abdomen early, anyhow, before we have an obstructive and destructive peritonitis instituted, i. e., in ten or twelve hours.

There are three or four conditions that simulate perforation: acute inflammation of the pancreas, acute appendicitis, cholecystitis, intestinal obstruction and another lesser known condition, angina pectoris with abdominal symptoms accompanied with fever and elevated pulse. I have had one such case in which I deferred operation and thereby saved the patient's life. These patients do not have the board-like rigidity which is always present in perforated ulcer cases, unless it has been relaxed by morphin. These conditions simulating perforation of a gastric ulcer or duodenal ulcer, with the exception of abdominal angina, are all surgical. There is something characteristic and distinctive about the abdominal rigidity and agonizing pain (the pain is always agonizing) when perforation has taken place. This is not the colic of acute indigestion, or the colic of constipation.

When confronted by the clinical picture described, there are two things to beware of, as they are equally deadly in their ultimate effect, and they are the too liberal use of morphine hypodermics, or an inexperienced but sanguine medical consultant, who advises that you mark time "until tomorrow."

I have nothing dogmatic to say about the method of procedure that shall govern the surgeon when the laparotomy is made, whether a simple closure of the perforation be done, whether drainage shall be used or not, whether a posterior gastro-enterostomy shall be made; all this must be determined by the condition of the patient at the time of operation. If much soiling of the peritoneum is present, if the perforation is more than twelve hours old, I am going to drain that pelvis through a supra-pubic stab wound and a good sized, well placed tube and then keep the patient in Fowler's position for three or four days. If considerable peritonitis is present I am going to bring forward my pet surgical remedy for this condition; that is the establishment of an enterostomy in the upper jejunum by placing a soft rubber catheter *properly* into the lumen of the bowel through which *pints* of normal salt solution are instilled and intestinal drainage is established. This method I have carried out with great satisfaction in the treatment of diffuse peritonitis, from any cause, for the past six years.

THE CHAIRMAN: In the absence of Dr. C. H. Mayo, I am going to call upon Dr. W. J. Mayo to discuss the paper, please.

DR. W. J. MAYO (Rochester): I am called on to substitute for a fine man. I have been much interested in the clean-cut exposition of Dr. Stangl, and the remarks made by Dr. Cooney I want to endorse. As Dr. Stangl says, in the diagnosis of acute perforation, the sudden attack of pain, the rigidity of the abdomen, and the rising leukocyte count are very important.

Why do so many patients with acute perforation come late to the surgeon? We know from general experience, and it certainly has been our own, that the patient who is operated on within eight hours after an acute perforation occurs, will probably get well. In patients operated on from twelve to twenty-four hours and more after perforation, the death rate goes up rapidly. In cases of acute perforation, delay in seeking early operation is often owing to what might be called the "fatal improvement," that is, the period following the primary effect of the perforation when the pain has been relieved by morphin, which misleads the attending physician into believing the trouble is a colic or temporary indigestion. The two important signs to which Dr. Stangl called attention, continuing rigidity of the abdomen and gradual increase in the leukocyte count, are so liable to be unobserved; in the presence of these two signs, apparent improvement should be disregarded, and operation performed at once.

Dr. Cooney spoke of enterostomy in the septic obstruction which appears with developing peritonitis and sometimes follows operation in the later stages. I am glad the question of this life-saving procedure has been brought up. In the treatment of the septic type of obstruction with reversed peristalsis, I know of nothing so valuable as a high jejunostomy, with two tubes, usually small catheters, one up to remove the toxic fluid intestinal contents regurgitated into the duodenum or stomach, and one down for the introduction of fluids, the salt solution with glucose of which Dr. Cooney spoke. In this way, an astonishing amount of fluid will often be removed from the intestine of the patient, with recovery. Within the last few months, Dr. Walters has operated in several cases of secondary sep-

tic peritonitis of this obstructive type, on patients apparently moribund, with recovery.

We should make a clear distinction between the acute perforating ulcers of the duodenum and those of the stomach. The duodenum does not always contain a large amount of fluid, and the fluid may be relatively sterile. In the duodenal perforations the contents are distributed by gravity about the cecum, sometimes leading to the diagnosis of acute appendicitis. Perforations of the stomach are very serious, because the stomach often contains a large amount of septic material which is distributed rapidly throughout the peritoneal cavity. In such cases, as Dr. Cooney said, it is usually wise to introduce a drainage tube through a suprapubic stab wound into the pelvis, set the patient up, and, if septic obstruction exists, do a jejunostomy in addition, inserting the jejunal tubes for the purpose of intestinal drainage and delivering fluids into the dehydrated patient.

DR. E. M. JONES (St. Paul, Minn.): I think a very important point, and one that has struck me very forcibly, is the slight degree of shock present in these cases during the first few hours. They have the rigid abdomen, the severe pain, but it is not uncommon to find them with a pulse of seventy to eighty, of very good volume. This is in marked contrast to the picture presented in acute pancreatitis. These cases are always in decided shock, with a characteristic thready pulse, and I think this is a very important differential point.

In regard to the white count, I, personally, do not feel that I would care to put much weight on the white blood count as a differential point in making a diagnosis when dealing with an acute abdomen, and especially when the question of an acute perforated ulcer presents itself. The crucial thing is to get in as soon as possible, and I would much prefer making an exploratory laparotomy rather than to wait for an increased white count to develop.

I believe that as little should be done as possible when dealing with an acute perforated ulcer. I never have felt that gastro-enterostomy was indicated unless there was a decided obstruction present. Many of these cases have been operated upon, the perforation closed, and they recover, and it has been shown that comparatively few of these ulcers that have perforated give further trouble. I think that is one strong point in favor of not doing a gastro-enterostomy unless we have a decided obstruction.

There is one thing that we have all seen and that has not been mentioned today as a very common complication following these cases of perforated ulcer, and that is a subphrenic abscess. After operation these cases may enjoy a very smooth convalescence, but ten days or two weeks later signs of infection may present themselves. In such cases we should always bear in mind the possibility of subphrenic abscess.

DR. VERNE C. HUNT (Rochester): One feature that has not been discussed is the time element at which operation may be undertaken. Some years ago Dr. W. J. Mayo called attention to the sequence of events that occurred after perforation of an upper abdominal viscus, and he described these in three stages: first, the stage of contamination; second, the stage of reaction; and third, the stage of pro-

gressive peritonitis. He called attention to the fact that perforations occurring in upper abdominal organs and operated on or explored within the stage of contamination, or the early part of the stage of reaction, had very excellent chance of recovery. He also emphasized the fact that patients who were operated on late, or during the stage of progressive peritonitis, practically always died.

This simply emphasizes the time element at which exploration may be accomplished or at which operation may be done with benefit to the patient, and bears out the observation that the longer the duration of the symptoms or the longer since the perforation until treatment is undertaken or the abdomen is opened, the poorer are the prospects of recovery. For those patients coming in the latter part of the stage of reaction or in the so-called stage of progressive peritonitis, some consolation may be obtained in the fact that perforations of the stomach, duodenum, or gall-bladder have a tendency to localize. Doctor Mayo, Doctor Deaver, and others have called attention to the perforations of the upper abdomen having this tendency toward localization. We know that as we see them at the operating table it is only a relatively small proportion of the gastric and duodenal ulcers which have a true perforation, that is, a free perforation in the upper abdominal cavity. Protective perforation often takes place posteriorly onto the pancreas or anteriorly onto the liver.

The majority of gastric ulcers as they are seen at the operating table may have been perforated but have had a protective perforation. When patients are seen late, from twenty-four to thirty-six hours after a so-called protective perforation may have occurred, it must be remembered that it is not necessarily a true perforation of the stomach; it may be a protective perforation with marked upper abdominal symptoms. I speak of this because there are times in which protective perforation does occur with pain and other symptoms simulating those of a true perforation, and the time interval is so great and condition of the patient so poor as to forbid operation, that under non-surgical management the patient usually recovers from the given attack.

The question of gastro-enterostomy is one regarding which there is a considerable difference of opinion. The question whether gastro-enterostomy should be performed at the time depends on the time interval between perforation and operation, and the condition of the patient, etc. I think it may be stated that the results that have been obtained by simple excision of gastric ulcers that have not perforated are not nearly as good as when simple excision is done with gastro-enterostomy. I think the same may be applied to gastric ulcers that have perforated. Experience has shown that many patients who have had simple closure of perforated gastric ulcer have required subsequent gastro-enterostomy. These results that have often occurred following closure of the perforation are due to the disturbance of motility. The better results occurring after gastro-enterostomy and simple excision are due to the fact that the disturbance of motility has been overcome by the gastro-enterostomy.

The mortality rate of surgical treatment of perforated gastric ulcer is directly dependent upon the time interval between perforation and operation, as to whether operation

is undertaken early in the stage of contamination or late in the stage of progressive peritonitis. As to whether simple closure or closure with gastro-enterostomy is made, all else being equal, the mortality rate is little affected. However, the subsequent functional result will be better with the latter procedure than with simple closure of the perforation.

DR. A. M. RIDGWAY (Annandale, Minn.): One thing that has been brought out by the different discussionists is in regard to pain. I do not think enough stress has been laid on pain. I, unfortunately, have had several of these cases. As soon as perforation occurs, the patient usually falls and is unable to walk or move. He has to be picked up and carried. The one who operates usually sees him several hours after the perforation has occurred, and they have been pretty well under the influence of morphine. The pain is excruciating at first and there is nothing else that produces the board-like rigidity of the upper abdominal muscles in my experience. I have never seen vomiting following perforation of the stomach or duodenum. Several of these cases of perforation have had no previous history of stomach trouble or pain. I mention these more for the younger men who have not seen many of these cases.

To illustrate: Mr. B., twenty-four years of age, a bus driver, no previous history of stomach trouble, drove from one to two hundred miles a day and had been for some time eating quite irregularly, and feeling fine. When this perforation occurred he had just finished a hearty dinner and was washing his bus when he was seized with the most excruciating pain and was unable to move and fell. He was picked up, carried to his home, but was not operated on until the following day. He made a nice uninterrupted recovery.

The second case: A young farmer, thirty years of age, had never had any stomach symptoms until the perforation occurred, which took place shortly after a hearty supper. He started out to walk about one mile to a country store but had only gone a short distance when he was taken with the most agonizing and excruciating pain and fell in the road. He had a flashlight with him which was observed by a neighbor woman. She, thinking it was some children playing, went to investigate and found this man sitting on the ground moaning with pain and in profound shock. I was called and gave him one-half grain of morphine hypodermically, also inhalation of chloroform, which relieved him sufficiently so that he could be removed to his home. He was operated the next morning. The perforation was at the posterior part of the stomach and about one inch in length. He made an uninterrupted recovery.

DR. L. SOGGE (Windom, Minn.): I just want to mention one case that I had a couple of years ago. This man had a gastro-enterostomy at the Mayo clinic about three years before this and it was working perfectly at this time. When I saw him he had a complete perforation of the upper anterior wall of the stomach large enough so one could introduce the little finger through that opening. How do you explain the necessity of doing a gastro-enterostomy at the time that you repair the opening in the stomach?

DR. W. H. MAGIE (Duluth): This paper, including the discussion of perforative ulcer of duodenum and the possi-

bility of traumatism causing ulcer, brings to my mind a case that came under my care about twenty years ago. This case gave a history of an injury caused by attempting to board a steamer as it was leaving the dock. When the steamer was about five feet away from the dock the patient jumped to the steamer in an attempt to board the boat. He missed his footing and fell, striking his epigastrium on the edge of the deck at the gangway, catching his pylorus between the deck of the boat and his spinal column. He was a slender man. He immediately became nauseated and vomited blood. He, as a result of this injury, contracted an ulcer. Some seven years later he came into my hands for treatment. At the operation I found an enormously dilated stomach with complete obstruction of the pyloric outlet. Gastro-enterostomy was performed on the posterior wall with a Murphy button and he gained twenty-one pounds in twenty-one days while in the hospital. This proves, without doubt, that trauma can cause ulcer of the stomach or duodenum.

The most important lesson we are learning here today from this paper and the discussion thereof is that these cases of chronic ulcer of the stomach and duodenum should be diagnosed before perforation takes place and operation done. Many of my cases have undergone treatment by the so-called Sippy treatment by Sippy personally as well as myself and other physicians. In my experience and from knowledge gained by other sources, Sippy, or anyone else, has never cured a chronic ulcer of the stomach or duodenum. Sippy treatment has cured a lot of cases of sour stomach but never chronic ulcer. These chronic ulcers get temporarily better under most any form of treatment when their diet is regulated, but they always recur.

The lesson, as I have stated before, that we learn here today or at least ought to learn is early diagnosis of chronic ulcer and early operation and at a time when there is no danger to the patient by operation, at the same time make up our minds to discard the Sippy humbug.

A few years ago a very dear friend of mine developed an ulcer of the duodenum or stomach. He was treated in Chicago for weeks and in one instance for months by Dr. Sippy personally, each time with improvement and each time pronounced cured. Afterwards he was treated by what I call an over-night specialist in Duluth, who graduated under Dr. Sippy one day and became or at least advertised himself as a Sippy assistant and a specialist in stomach disease the next day. About four years ago I met my friend at the club and the discussion of his case came up. I then made the statement to him that Sippy treatment never did cure a chronic ulcer of the stomach or duodenum and warned him about the dangers of relying on the so-called Sippy treatment. This man was in the habit of spending his winters in California. I stated to him that he took great chances in refusing operation and that his ulcer was liable to perforate and maybe while he was in California and not having faith in surgery, he would delay operation until too late and probably fall into the hands of some incompetent surgeon, who would operate and he would probably lose his life. This very thing happened last spring. He had a perforation, was operated and died. I don't know who his surgeon was but have heard the operation was a late one.

This is what is happening to a lot of people who are suffering with chronic ulcer and will continue to happen with a whole lot of people who continue to monkey with this humbug known as the Sippy method.

DR. B. F. VAN VALKENBURG (Long Prairie): It seems to me that the question before the house is not the treatment of perforated ulcer. We admit that the proper treatment for that is undoubtedly operative, but the purpose of this paper, as I understand it, is to call the attention of the physicians to the early diagnosis and treatment of perforated gastric ulcer. Now I haven't had very many myself. I have had two or three, and one of them a fatal one. I really think that the points we should discuss and bring to the attention of the physicians of the state are the symptoms that go with a silent ulcer, perforated. These are the cases that I have been so thoroughly disappointed in so that I am glad to be here to hear what is to be said regarding this question.

I don't think we have anything in surgery or in the abdominal cavity that calls for immediate attention more than a perforated gastric ulcer. It is only a short time ago that I had a case that came to my attention at ten o'clock at night, and I failed to operate until the next morning, and it proved fatal. The idea in my mind is this: Let us find what are the most alarming symptoms of this very dreaded trouble. This case that I have reference to I found out in the country about eight or ten miles with the history that he had never had any stomach symptoms previously. He could eat anything and he had nothing to indicate that he had an ulcer. Now those are the alarming features that we meet in the country and undoubtedly you will find them in the city also, and those are the cases that we should have as typical cases to make our diagnosis and have certain symptoms to go by to make a diagnosis.

We have a whole lot in the abdominal cavity and we have a good many things there that can cause pain, but I do not believe, so far as my experience of thirty-one years of practice goes, that there is anything that gives you that characteristic pain of the abdominal cavity that a perforated gastric ulcer will give. It is the most striking pain that can come up in the abdominal cavity, as far as my experience is concerned. I haven't seen hundreds of them or dozens of them, but I have seen three or four that were very striking cases, and out of the four that I have seen and had under my care there has been only one of them that has given me a history that they had anything to do with stomach disturbance. So when we have these cases come up before us as silent ulcers, perforated, they are alarming; they are cases that need immediate attention;

and if they don't get it, my experience has been that they go to the grave.

As a general practitioner who does surgery when it comes to him, what are the symptoms that one should have before him and never forget in the treatment of these ulcers? There is a rigidity of the abdominal muscles that is not comparable to other diseases, and there is no temperature. There is an absence of the symptoms of suppuration and still the patient is in extreme pain. One-half grain of morphin will not quiet him, and I would like to ask the doctors here today if there is any other disease, any other pain in the abdominal cavity, that will not be relieved by a grain of morphin. I would like to call your attention to one fact: that you have a pain in the upper abdominal cavity that is equalled by no other malady in severity.

DR. P. E. STANGL (closing): Several points were brought up in the discussion and I will try to answer most of them.

The question of compensation under the state compensation act brings to mind one of the above cases. He was struck on the abdomen early in the morning and suffered a perforation. The case was denied before the Minnesota State Labor Commission.

As to differential diagnosis I think there are very few conditions with which this might be confounded and in all of our cases a direct diagnosis without question was made immediately.

Dr. Mayo spoke of duodenal ulcer not producing as active a symptom complex as gastric ulcer. Such has not been our experience and we believe that the location of the stomach in relation to the anterior abdominal wall and the fact that the perforations take place on the anterior wall of the stomach as compared with the location of the duodenum makes it possible for the opening in the stomach to come into more direct contact with the natural protection of the abdominal wall as compared with the duodenum, and this fact, we believe, is the reason for the occasional quieting of symptoms about two hours after a gastric perforation.

The white blood-count is not diagnostic in itself but is the one confirming part of the diagnosis.

In answering Dr. Cooney we believe that if such an amount of general peritonitis exists as to call for more treatment than simple drainage, the case has gone beyond the point where surgical measures are of avail.

Considerable discussion as to the early diagnosis of ulcers is rather out of the scope of this paper and it is our intention to consider ulcers already perforated as we see them and disregarding any previous gastric disturbance.

COLON BACILLUS VACCINE, GONOCOCCUS SERUM AND GONOCOCCUS VACCINE OMITTED FROM N. N. R.

The Council on Pharmacy and Chemistry reports that all colon bacillus vaccines, gonococcus serums and gonococcus vaccines have been omitted from New and Non-official Remedies. The Council took this action because an examination of the existing evidence goes to show that these preparations are not of therapeutic value. (*Jour. A. M. A., Jan. 17, 1925, p. 220.*)

EUCAIN

Originally, two kinds of "eucain" were on the market, namely, "alpha eucain" and "beta eucain." The use of the first product has been generally abandoned. The second product is official in the U. S. Pharmacopeia in the form of hydrochlorid (betaeucain hydrochlorid). Betaeucain hydrochlorid is a local anesthetic like cocain, but weaker and devoid of the stimulating properties of the latter. It does not dilate the pupil, nor does it contract the blood vessels as does cocain. (*Jour. A. M. A., Feb. 28, 1925, p. 698.*)

THE PROGRESS OF CARDIOLOGY DURING 1924: A REVIEW OF THE WORKS OF CLINICIANS AND INVESTIGATORS IN THE UNITED STATES

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(Continued from page 170, March issue)

VI. BLOOD PRESSURE

In a study of arteriosclerosis in relation to hypertension, O'Hare and Walker concluded that the peripheral vessels play little or no part in hypertension, but that a definite relationship exists between sclerosis of the small vessels, the retinal arteries, and high blood pressure. The ophthalmoscope may fail to reveal arteriosclerotic changes while the microscope reveals vascular changes in the retina. There may be choroidal arteriosclerosis without retinal arteriosclerosis. These authors believe that involvement of the small vessels undoubtedly is quite generalized.

Moschcowitz believes that evidence exists that a congenital peripheral resistance, either in the form of congenital stenosis of the isthmus of the aorta, or of a congenitally narrow aorta, may be the cause of hypertension, arteriosclerosis, and nephritis. It would be necessary to prove this hypothesis by careful clinical and necropsy correlation of a representative group of cases before its acceptance would be justified.

To determine the rôle that infections play in hypertension, Walker and O'Hare made a study of the comparative incidence of previous infections in 400 unselected hospital patients with normal blood pressure, and 400 with hypertension. The relative incidence of the various infections in the histories of these patients did not indicate that infections play a very important part in the causation of hypertension.

O'Hare, Walker and Vickers investigated the influence of heredity of hypertension. The two main conclusions from their observations are: (1) that heredity plays one of the most important rôles in the production of hypertensive disease; and (2) that Nature very often gives warning as early as the second decade of life of the possible development of hypertension in the fourth or fifth decade. They urge that the younger members of

these "vascular" families be protected against the strains that play such an important part in the production of hypertension.

The relation of blood pressure to the amount of renal tissue was studied experimentally by Anderson. The gradual rise in blood pressure in chronic glomerulonephritis, usually observed as the disease progresses, has been attributed by some observers to progressive atrophy of renal tissue. Anderson found that the removal or destruction of about 70 per cent of the renal tissue in rabbits did not produce hypertension, even when prolonged renal insufficiency resulted.

Performing similar experiments, Cash obtained different results. Reduction of renal tissue by excision and also by ligation of renal vessels was followed, under certain conditions and in most of the cases studied, by a rise of both systolic and diastolic blood pressure, averaging about 27 mm. of mercury. This change occurred when there was a reduction of total renal substance to at least 50 per cent, and when a portion of the kidney which had been deprived of its circulation was allowed to remain in situ. Extensive necrosis of renal tissue alone, such as occurs in widespread infarction of one kidney, or ligation of one branch of a renal artery, was not sufficient to cause any rise in blood pressure. Complete excision of one kidney likewise produced no elevation in blood pressure. The increase in blood pressure reaches its height a few days after completion of the operative procedures, after which it tends to return to normal. The rapidity with which this change occurs seemed to be roughly proportional to the amount of functioning renal tissue remaining. After the reduction of the total renal substance, varying from 25 to 85 per cent, no appreciable change occurred in the amount of nonprotein nitrogen or total chlorids of the blood. When the reduction exceeded 50 per cent there was always a retention of phenolsulphonephthalein. No constant changes occurred in the volume of the circulating blood, and edema was not produced during the course of these experiments.

Major and Stephenson, in their studies with the guanidin bases (methyl guanidin, sulphate, nitrate, dimethyl guanidin sulphate, guanidin carbonate, guanidin thiocyanate and guanidin hydrochlorid), found that they had a powerful pressor effect, raising blood pressure, and maintaining it at a high level. This was accompanied by a decrease in the

pulse and respiratory rate. The rise in blood pressure produced by these substances may be abolished promptly by the use of calcium chlorid, either alone or combined with potassium chlorid.

The relation of age to the size of the heart with special reference to the influence of hypertension has been studied by Bell and Hartzell. They concluded that the increase in the average size of the heart, after the fourth decade of life, is largely due to the influences of hypertension, and between the third and fourth decades, to increased body weight.

In a study of 100 cases of hypertension in which the heart was investigated, O'Hare and Walker found the average age to be fifty-five years. The blood pressure ranged from 152 systolic and 76 diastolic, to 290 systolic and 170 diastolic. In 28 per cent, the diagnosis of chronic myocarditis was made while cardiac symptoms were noted in a much larger number. Dyspnea was the most common symptom, occurring in 60 per cent. Cheyne-Stokes breathing was often a terminal event. Another type of dyspnea, paroxysmal nocturnal smothering, occurred in thirteen patients. This symptom had no definite relation to the height of the blood pressure, being associated with pressures as low as 160 systolic and 95 diastolic, but much more often with high diastolic pressures. Paroxysmal dyspnea occurred in only one patient who had precordial pain. Cardiac pain was usually present as a dull ache in the region of the apex and lower precordia. Typical angina pectoris occurred in only three cases. Edema of the lower extremities was present in 29 per cent of the cases. There was no instance of acute pulmonary edema. Cardiac hypertrophy was noted in 83 per cent. Thirty of fifty electrocardiograms showed preponderance of the left ventricle; twenty-nine showed no unbalance; and one showed questionable preponderance of the right ventricle.

Miller, in discussing a blood pressure paradox, has called attention to the fact that in certain blood-pressure examinations, the fourth phase may extend down to the zero point, resulting in the entire absence of the fifth phase. Therefore, those observers who rely on the fifth phase apparently find the diastolic pressure at zero, and are mystified. He emphasizes the importance of recording the diastolic pressure at the beginning of the fourth rather than at the fifth phase. This blood pressure paradox occurs at times with hyperthyroidism,

aortic regurgitation, fracture of the skull, or during general anesthesia.

In studying the blood pressure of the new-born, Rucker and Connell found the mean systolic pressure at birth to be 55 mm., and the mean diastolic pressure to be 40. The systolic pressure increased with age more rapidly than did the diastolic. Toxic states of the mother seemed to influence the blood pressure of the child, and markedly on the first day of life. They found that the blood pressure in general varied directly with the total length of the infant.

Mussey and Randall, in reviewing the records of 523 pregnant women, found that 104 of them sometime during pregnancy had had a systolic blood pressure of 140 or more. This observation is regarded as being a fair index of the onset of toxemia. Of the patients with elevated blood pressure readings less than thirty years of age, 72 per cent had toxemia, while 54 per cent of those with elevated blood pressure readings more than thirty years of age had toxemia.

A study of arterial hypotension, made by Levison, includes patients having blood pressures below 100, but exclusive of such diseases as tuberculosis, anemia, cachexia, acute infection, and adrenal disease. The symptoms elicited from the patients were so diverse and variable that it was impossible to construct a characteristic syndrome. The most constant symptoms were exhaustion, inability to engage in prolonged or constant mental or physical work, restlessness, headache, listlessness or apathy, and digestive disturbances. Levison found that the vital capacity and the renal functional tests in these uncomplicated cases did not vary materially from the normal.

VII. ARTERIES

Boas, in studying clinical "capillary pulsations" concludes that the clinical capillary pulse, as visualized on the lips, forehead, and the finger over the root of the nail, is chiefly a phenomenon of the subcapillary and cutaneous vascular plexuses, and not of the capillaries of the papillæ of the skin and mucous membranes.

In reviewing arterial aneurysms at the Cincinnati General Hospital during a period of six years, Benjamin and Wiedemer found sixty-one cases, or an incidence of 0.6 per cent. Fifty-three of these involved the thoracic aorta and twenty-seven the arch. Pain in and about the chest (twenty-nine cases), cough (twenty-five cases), and dyspnea

(twenty-four cases) were the chief symptoms. Other symptoms were hemoptysis (five cases), dysphagia (four cases), and aphonia (seven cases). Albumin and granular casts were present in nineteen cases. The Wassermann reaction was positive in 66 per cent, and doubtful in 23 per cent. Eighteen patients improved under treatment and thirty-seven died. These authors maintain that potassium iodid is the drug of choice in the treatment of such cases.

Mayers reported two cases of aortic aneurysm which ruptured into the superior vena cava. He found that forty-five cases had been reported previously. Kahn reported an interesting and unusual case of a pulsating abscess of the chest wall which simulated aneurysm.

Howard in a discussion on syphilis of the heart and blood vessels calls attention to the fact that a great advance has been made in the recognition of syphilitic cardiovascular disease. He believes that adequate treatment will increase the comfort and the life expectancy of these patients.

Ridge, in his experience with cardiovascular syphilis, found that the most constant early symptom was neuralgic pains in the neck, extending upward toward the occiput and along the carotids, and sometimes radiating to the left shoulder. The next most constant symptom was a persistent fullness in the epigastrium, extreme on slight exertion. He believes that angina pectoris is a precursor of death. The prognosis in cardiovascular syphilis is very grave, and treatment for syphilis is of little value.

In a study of 140 patients with syphilitic disease of the aorta, Willius and Barnes divided the cases into three groups representing three stages, according to the degree of apparent damage. In the early stage there were thirteen cases, ten males and three females. The characteristic objective findings of aortic disease were absent. The authors emphasize the importance of the peculiar tambour-like accentuation of the aortic second tone, probably due to a loss of elasticity or resilience of the aorta as the result of syphilitic periaortitis. This was first described by Potain. Three of the patients had no cardiovascular symptoms, five had mild dyspnea, and two had angina pectoris. The Wassermann reactions were positive in nine cases, and negative in one. There was no cardiac mortality in this group. In the moderately advanced stage, there were thirty patients, nineteen males and

eleven females. The chief objective finding was a rough and reverberant systolic murmur localized to the aortic area and frequently transmitted into the carotids. Six patients had no cardiovascular complaints, thirteen had varying degrees of dyspnea, palpitation and other symptoms of cardiac inefficiency, and eleven had angina pectoris. The Wassermann reactions of fifteen patients were strongly positive, of twelve, negative, and of three, not recorded. Two patients died of heart disease, an average of fifteen months after examination. In the advanced stage there were 100 cases, eighty-eight males and twelve females. The syphilitic aortitis had progressed to the development of aortic regurgitation in this group. Aneurysm was not included due to lack of space. All the patients had symptoms referable to the cardiovascular system. The Wassermann reactions were strongly positive in seventy-two cases, negative in twenty-five, and not recorded in three. Thirty-one patients died from heart disease, an average of fourteen months after examination.

VIII. CONGENITAL HEART DISEASE

Every report of an unusual case of congenital heart disease is in itself an important contribution to the knowledge of cardiology.

The case of an adult is recorded by Canavan in which a deficient pericardium existed. No pericardium was visible except a triangular-shaped flap, which blended with the epicardium over the right side of the heart, and was attached at the apex, and near the origin of the great vessels. The posterior surface of the heart was entirely devoid of pericardium. The action of the heart was never attended by any known clinical irregularity. According to Maude Abbott, this defect in the pericardium may be accounted for by a too early atrophy of the left duct of Cuvier, owing to some anomaly of the circulation of the great venous trunks, the arrested development of the pulmonary ridge resulting in a localized defect of the pleuro-pericardial foramen, or owing to a more or less complete absence of the pleuropericardial septum.

Cosgrove and St. George report a case of ectopia cordis, fortunately a rare anomaly.

An unusual admixture of congenital defects is reported by Connally, in which a congenital stenosis of the mitral valve was combined with hypoplasia of the left auricle and ventricle, and the aorta was rudimentary.

Moench describes a case of aneurysmal dilatation of the pulmonary artery associated with patency of the ductus arteriosus (Botalli). Death occurred from rupture into the pericardial sac.

A case of congenital complete heart-block is described by Romberg and White.

IX. SIZE OF THE HEART

Fossier believes that percussion is of greater value than the x-ray in determining the size of the heart. Comparison between a person's heart and fist is the only practical determinator of the size of the normal heart. The linear dimension of the transverse diameter of the heart corresponds to a line drawn from the juncture of the inner side of the right hand and wrist, and ending at the middle joint of the fourth finger. This method of determining the size of the normal heart, while unique, is obviously open to many objections.

Transitory alterations of cardiac size and blood pressure have been observed by Eyster and Middleton with hemorrhage and blood transfusion in man in quantities within 1 per cent of the body weight. Compensatory agents cause a rapid readjustment to normal circulatory conditions, notwithstanding the altered blood volume.

Gordon and Wells found that inhalations of amyl-nitrite temporarily diminished the size of the heart of the cat, associated with a fall in blood pressure. Epinephrin during its vasoconstricting effect caused a transient increase in heart size with a rise in blood pressure.

X. CARDIAC RESPONSE TO EXERCISE

Propst's observations have led him to conclude that the so-called blood-pressure response to exercise in organic heart disease is of little prognostic value. In his series only 3 per cent of cases with organic heart disease gave positive reactions. Propst believes that the changes in blood pressure are due to vasomotor rather than to myocardial changes.

Ten children with chronic heart disease, said to have slightly diminished tolerance to exercise, were examined by Wallace, who found that they performed the activities of normal children easily and without evident physical detriment. These children were able to climb stairs rather swiftly without signs of cardiac embarrassment. The changes in blood-pressure reaction after a given degree of effort in children with mild heart disease were usually slightly longer than in children with nor-

mal hearts, and were still longer in children with severely damaged hearts, especially if mitral stenosis was present.

In a study of the heart affected by auricular fibrillation under exercise, Blumgart found that a disproportionate rise in ventricular rate occurred, followed by a delayed return to the previous resting level, as compared to the reaction of a normal heart. This is not due to the abnormal mechanism, as the same observation holds after a regular rhythm has been established. Digitalis in ordinary therapeutic doses does not protect the ventricles from the exaggerated response to exercise. As the ventricular rate rose, the auricular rate usually fell.

XI. TREATMENT

The committee appointed by the Council on Pharmacy and Chemistry, comprising Robinson, White, Eggleston, and Hatcher, have outlined the limitations of digitalis treatment and the methods of obtaining effects from it. They call attention to the danger of administering digitalis in cases of partial heart-block, and particularly of administering it intravenously as an emergency measure in cases of acute heart failure when a careful study of the heart has not been made. In auricular fibrillation digitalis is definitely indicated, and in any case oral, rather than intravenous or intramuscular, administration is the method of choice. Digitalis may slow the ventricular action in cases of auricular flutter, and tend to increase the efficiency of the heart. In certain cases digitalis may cause extrasystoles to disappear, and if the drug has not been given, their presence is not a contraindication to its use. In complete heart-block the effect of digitalis on the conduction system may be disregarded. Digitalis, however, should not be given in cases of temporary block when return to normal mechanism is anticipated. Patients with chronic myocarditis with signs of heart failure and normal rhythm will often be greatly improved by digitalis, but such patients are often unusually susceptible to the toxic effects of the drug, and it should be administered only by mouth. Less benefit should be expected from digitalis in cases of aortic regurgitation, although valvular lesions do not alter its indications. It is only in the exceptional case, in which digitalis action is urgent and should be obtained in two hours or less, that its intravenous or intramuscular administration is justified. In cases in which nausea or vomiting contraindicates the oral administration of the drug, therapeutic effect may be ob-

tained by its rectal administration. The total average dose of a fairly active standardized digitalis by mouth for inducing full therapeutic effects within thirty-six to forty-eight hours in an adult who has not received digitalis within ten days, is about 1.5 gm. of the leaf, or 15 c.c. of the tincture. This may be given in divided doses every four or six hours, or half of the total dose may be given at one time and the remaining half in two divided doses after four to six-hour intervals. If there is doubt concerning recent medication, smaller doses of from 0.1 to 0.3 gm. of the leaf, or from 1 to 3 c.c. of the tincture, should be given three or four times daily.

Luten found favorable effects from the drug a short time after the administration of massive doses to patients with normal mechanism. The total dose was estimated by the Eggleston method for an average tincture, and an amount somewhat smaller was chosen. The signs of improvement were diuresis, loss of edema, and a decrease in the size of the liver without a constant change in the ventricular rate. He attributes the improvement to increased myocardial efficiency by direct action on the muscle. Under proper administration of digitalis the patients with normal mechanism improved comparably to those with auricular fibrillation.

Levy reported favorable results following the rectal administration of "digitan." One cubic centimeter of this preparation is equivalent to 0.1 gm. of the powdered leaf, and 8 to 20 c.c. of digitan in 25 c.c. of water were given by rectum. Slowing of the ventricular rate was obtained on an average of two hours and thirty-five minutes after administration, and the effect was maximal after nine hours and thirty minutes. T-wave negativity in the electrocardiogram was observed after an average interval of two hours and thirty minutes, almost coincidental with ventricular slowing.

The results of Willius were similar to those of Levy. The studies are based on the use of the Minnesota-grown leaf, prepared as a standard tincture. In most cases one rectal instillation of 6 c.c. of the tincture in 100 c.c. of normal salt solution was given, and repeated daily until the desired degree of digitalization was obtained. In a smaller group of cases three daily rectal instillations of 2 to 2.5 c.c. of the tincture in 60 c.c. of normal salt solution were given. By giving the large dosage, a distinct effect was obtained within one or two

days, while with smaller doses three to five days were required to obtain the same results. No untoward effects have been encountered, either from the drug or from rectal intolerance. This method of administering digitalis is indicated in cases in which the drug cannot be given by mouth as in cases immediately after operations on the stomach, in cases of acute gastro-intestinal crisis of exophthalmic goiter, in cases of vomiting due to splanchnic congestion, and in certain cases of incomplete digitalization.

In commenting on the accuracy of the cat method for the assay of digitalis, Haskell and Courtney re-emphasize the fact that one or two cats are inadequate to determine accurately the strength of a digitalis preparation. They insist that the procedure must be carried out on a large number of cats.

Reid has observed five cases in which ectopic ventricular tachycardia appeared during the treatment of auricular fibrillation by digitalis. The amount of the drug administered before the onset of this disorder was well in excess of that indicated by the Eggleston method of calculation.

A very interesting comparative study of digifolin administration is reported by Clarke. Five ampules of digifolin (0.5 gm. of standardized digitalis leaf) were administered at twelve-hour intervals. An average slowing of the heart rate was noted in from three to four hours after intravenous injection, in four hours after intramuscular injection, and in six hours after oral administration. The amount of digifolin which shows the earliest and full therapeutic effect is about the same for the intravenous and the intramuscular methods of administration. About one-half again as much is required by mouth. Clarke reports two deaths which were apparently due to digifolin. The cost of digitalization is between \$2.50 to \$4.00 for each patient.

Pardee, in summing up his conclusions on the use of quinidin in heart disease, emphasizes particularly that the drug should not be used in cases of severe heart failure. It tends to increase the cardiac failure, and if normal rhythm is not quickly restored, irreparable harm may be done. The danger of embolism is greater with severe failure. He advocates the use of digitalis first in any type of heart disease, and then if auricular fibrillation persists, quinidin may be tried. This drug is beneficial in cases of extrasystolic arrhythmia. To re-emphasize the potential dangers of treatment by

quinidin, Wyckoff and Ginsberg report two cases of sudden death following its use. Quinidin sulphate was used by Musser in a group of patients having premature contractions. In no instances were bad results noted, and in 60 per cent of the cases very good results were obtained. In the majority of cases the premature beats disappeared, or the frequency and number of premature beats distinctly subsided.

Wedd studied the action of various drugs in clinical flutter. He believes that the action of digitalis, atropin and quinidin in cases of flutter is consistent with the theory of a circus movement. The changes produced by digitalis are variable, the reaction being a complex one depending on the dual action of the drug. Atropin may cause a fall or rise of auricular rate, while the ventricle tends to respond at a half rhythm. Quinidin produces a fall of auricular rate; the ventricular rate may rise or fall depending on its original rate, but tends to maintain a 2:1 rhythm. Wedd suggests that in the treatment of auricular flutter the production of auricular fibrillation should be avoided if possible, and by the combined use of digitalis and quinidin, or by following digitalis with quinidin, this may be effected by breaking up the circus movement by raising the refractory period of the muscle.

A study of camphor-in-oil in relation to cardiac stimulation led Marvin and Soifer to conclude that camphor has no demonstrable action on the circulation in congestive heart failure, and therefore no rational place in the treatment of that condition.

Mendenhall and Camp found that acetylsalicylic acid has a stimulating effect on the heart muscle, which is evidenced by a lowering of the threshold on electrical stimulation. The effect of this acid is directly on the heart muscle, and not due to paralysis or inhibition of the vagus mechanism. The drug is depressant to the heart muscle only in concentrations much higher than are likely to occur even in enormous doses.

I advocate the use of desiccated thyroid extract or thyroxin in cases of complete heart-block with Stokes-Adams attacks, if there are no evidences of heart failure. The dosage of thyroid is best determined by careful and repeated estimations of the basal metabolic rate, and it is important to maintain normal rates. I have discussed in detail the probable underlying principles of the cardio-

vascular dynamics of the beneficial effects of thyroid in this condition.

Neuhof describes his experience with novasurol, a German preparation, prepared in ampules of 1.2 c.c. It is a double salt of oxymercurichlorophenoxy sodium acetate and diethylmalonylurate. It is a water-soluble preparation containing about 33 per cent of mercury. He advocates its use in the edemas of cardionephritis that have been refractory to the usual methods of treatment. The drug may be given intramuscularly in doses of 1.2 c.c. daily for one to three days. Its use is contra-indicated in acute glomerulonephritis and enteritis.

XII. SURGICAL PROCEDURES

Since Jonnesco's report of a case of sympathectomy for angina pectoris, a wave of enthusiasm has swept this country, and undoubtedly many operations have been performed when the indications were questionable. It is fitting in this connection to set forth the views on this subject of the great clinician, Sir James Mackenzie. "The impression has got abroad that the feats of the surgeon are indications of the progress of medicine. When an operation is carried out with a full knowledge of the morbid conditions which it is intended to relieve, and with a knowledge of the functions of the structures which the surgeon cuts in his operation, there might be some reason for regarding such surgery as an example of the progress of medicine; but when the surgeon is profoundly ignorant of the morbid condition for which he operates, and of the functions of the structures which he mutilates, it is impossible to conceive anything more detrimental to progress. At one time the surgeon was supposed to have a knowledge which would enable him to make not only a diagnosis, but a prognosis, so that he could tell whether his interference would be to the patient's benefit. But the trend of modern medicine with its specialism is that the surgeon dispenses with this kind of knowledge and relies upon others for instructions when to operate."

Reid and Friedlander report two cases of angina pectoris for which sympathectomy was found. One patient remained free from pain after twelve months, but was annoyed by widespread sensory disturbances. The other patient died suddenly two weeks after operation, although there had been no repetition of painful attacks.

One case is reported by Halstead and Christo-

pher. The patient was observed for fifty-two days after operation, and one attack of angina pectoris occurred.

Jennings and Jennings review twenty-one cases of operation for angina pectoris, with nineteen recoveries and two deaths. In sixteen cases the operation was resection of the cervical sympathetics, and in five resection of the depressor nerve. Relief from the anginal pain was more or less complete with both operative procedures. Either operation, therefore, cuts the pathway of the sensory nerves from the field producing angina pectoris.

Brown and Coffey believe that cutting the left superior cardiac branch of the cervical sympathetic and the main trunk below the ganglion, has eliminated the chief factor in producing anginal attacks, and apparently the one from which death occurs in attacks. They believe that it may be necessary at times to perform a bilateral operation completely to relieve the painful attacks.

The report of Reid and Eckstein is fitting in this connection; a patient developed severe pain simulating trifacial neuralgia eight days after a left cervical sympathectomy. The pain was associated with marked sensory disturbances over the entire left side of the body from the head to the costal margin.

Marvin and Harvey report a case of adherent pericardium in which extremely gratifying results were obtained by cardiolysis, according to the technique of Brauer.

A very interesting instance of stab wound of the heart is described by Davenport, in which in his operative repair he was forced to ligate the inter-ventricular branch of the left coronary artery and vein. The patient recovered. The clinical and electrocardiographic aspects of this case were discussed by Smith in 1923.

Allen's experiments on intracardiac surgery indicate that surgical procedures inside the cavities of the normal heart of etherized dogs under the guidance of vision can be carried out with impunity, without undue haste and without interruption of the circulation. In operating on the mitral valve the approach of choice is through the left auricular appendage. Following the cutting of the mitral valve very few changes are detectable in the action of the heart. The wound in the wall of the left auricle heals perfectly, and the split in the valve does not grow together again.

In a study on blood pressure in operative surgery and in general anesthesia, Coburn found that the majority of patients show an elevation of blood pressure on entering the hospital and still more just before anesthesia. This undoubtedly is accounted for by excitement and mental stress. A fall in blood pressure usually follows deep anesthesia of some duration; it also follows severe trauma. He found that the best means of combating shock and hemorrhage was by the use of gum-glucose solution (250 c.c. given at the rate of 4 c.c. each minute) and transfusion of blood.

(To be concluded)

"F. & R.'S GENUINE GLUTEN FLOUR" NOT ACCEPTED FOR N.N.R.

"F. & R.'s Genuine Gluten Flour" (Farrel & Rhines Co.), according to the label, contains 40 per cent of gluten. The label contains the statement that the product complies "in all respects to the Department of Agriculture requirements for Gluten Flour." This is a reference to a Food Inspection Decision of the Department under which the designation "Gluten Flour" may be applied legally to a product which contains as much as 44 per cent of starch. The product is technically within the requirements of the government's definition of a gluten flour; it is not, however, a safe food for indiscriminate use by diabetics. When gluten flour is prescribed by physicians it is for the purpose of providing a substance that is low in starch and other assimilable carbohydrates. The Council declared F. & R.'s Genuine Gluten Flour inadmissible to New and Non-official Remedies because the application of the term gluten flour to a preparation containing 40 per cent of starch is likely to be misleading and dangerous. (*Jour. A. M. A., Feb. 14, 1925, p. 533.*)

RAZ-MAH, ANOTHER ASTHMA AND HAY-FEVER NOSTRUM

Are you kept awake by asthmatic attacks or hay-fever? "To sleep tonight, use Raz-Mah today." This is the slogan for a nostrum put out by Templetons, Inc., of Detroit for sale in the United States and by Templetons, Ltd., Toronto, for sale in Canada. An analysis made in Canada about four years ago showed that each Raz-Mah capsule contained a little more than 4 grains of acetylsalicylic acid, about $\frac{1}{2}$ grain of caffeine and $\frac{8}{10}$ of a grain of bone-black. About the same time the A. M. A. Chemical Laboratory made some tests and also reported finding acetylsalicylic acid, caffeine and charcoal. An examination recently made in the A. M. A. Chemical Laboratory showed that Raz-Mah was essentially a mixture of acetylsalicylic acid, caffeine and an iodid. Another sample of Raz-Mah, however, contained no iodid. The presence of iodid seems to be accidental and for all practical purposes, Raz-Mah may be considered to be composed of acetylsalicylic acid and caffeine. (*Jour. A. M. A., Feb. 28, 1925, p. 694.*)

TUBERCULOSIS AND OTHER RESPIRATORY INFECTIONS AMONG UNIVERSITY STUDENTS*

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In the fall of 1920 a special clinic was opened at the University of Minnesota Health Service for the diagnosis and treatment of tuberculosis and diseases of the lower respiratory tract among university students. The present paper is a brief report of the accomplishments of this clinic during the first four years of its existence.

Each student upon entering the University of Minnesota is given a careful physical examination; therefore, no attempt has been made to examine in our special clinic any students except those referred by the other physicians, or those making requests for examinations. The attendance has always been entirely voluntary on the part of the students.

During the first four years, approximately 800 students reported for special chest examination and treatment. The majority of these students have reported several times; indeed, some have been under medical supervision since the clinic was opened.

Before rendering diagnoses we have attempted to compile and analyze all possible evidence. In addition to the history and physical examination, stereoscopic x-ray plates have been requested in most cases. Tuberculin tests have been employed when indicated and within the past year the ring test has been made a routine procedure. Although it is too early to draw any final conclusions, we feel that we have been very definitely helped by this test. The vital capacity test has been employed in most cases.

In only twenty-six cases have we been compelled to render unwarranted diagnoses. These are stu-

*Read before the fifth annual meeting of the American Student Health Association, New York City, January 1, 1925.

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Studies on the respiration organs in health and disease XV.

Note: This study was carried out with the aid of a grant from the Research Fund of the University of Minnesota.

dents who reported once but did not return for the completion of their examination. Some of them made their visits just before the end of their university course, and with the close of the school year left the city. Others, on their first visits, were told that there were rather suggestive findings in their chests which required further study, whereupon they immediately consulted their private family physicians, in whom they had extreme confidence. A few refused to return because venepunctures were done on the first visit. And, still others were lured away by medical imitations and fakers. However, this group with unwarranted diagnoses constitutes only about three per cent of the total number examined.

Table I shows a group of 197 cases in whom no evidence of chest pathology could be elicited. Some of these students reported for examination because of histories of exposure to tuberculosis. Others were referred by physicians because of questionable conditions in other parts of their bodies. By far the larger number of them reported because they had accepted the teaching that one should be examined frequently and thoroughly while in apparently good health rather than to wait until advanced disease is present. It has been most gratifying to us to see the number of such students increasing from year to year.

In our climate the incidence of acute upper respiratory infections and acute bronchitis is quite high during the winter months. However, only thirteen cases of acute upper respiratory infection were reported to our clinic. This is because such cases usually report to the physicians in charge of general internal medicine clinics and are referred to special clinics only when the condition becomes very obstinate. This is partially true also of the students suffering from acute bronchitis; however, more of them (Table I) associate cough and expectoration, although of short duration, with tuberculosis. They become somewhat alarmed and request complete chest examinations. The treatment in these cases has consisted for the most part of rest, forced fluids, mild laxatives, inhalants, cough sedatives, mild expectorants and at the proper time creosote.

Fifty-three cases have been under treatment for chronic bronchitis. Some of these cases followed gas poisoning during the world war, while others followed repeated attacks of acute bronchitis. A few of these cases have been very obstinate, par-

ticularly during the winter months. Our treatment has consisted of insistence upon well regulated living with rest playing a considerable rôle; at times cough sedatives, creosote, and inhalants. In a few instances we have resorted to autogenous vaccines, but our results have not been particularly gratifying; however, our use of the vaccines has not been sufficiently extensive to justify condemnation.

TABLE 1
SHOWING CLASSIFICATIONS OF 803 STUDENTS AFTER SPECIAL
CHEST EXAMINATIONS

Diagnosis unwarranted	26
Entirely negative	193
Acute upper respiratory inspection.....	13
Acute bronchitis	200
Chronic bronchitis	53
Bronchiectasis	5
Bronchial asthma	11
Acute fibrinous pleurisy	30
Idiopathic pleurisy with effusion	4
Suppurative pleurisy	10
Chronic fibrous pleurisy	23
Spontaneous pneumothorax	1
Tuberculous cervical adenitis	5
Tuberculosis of the bone	1
Tuberculosis of the soft palate	1
Tuberculosis of the kidneys	2
Tuberculosis of the peritoneum	1
Peribronchial infiltration	11
Peribronchial tuberculosis	53
Demonstrable non-clinical pulmonary tuberculosis.....	58
Arrested pulmonary tuberculosis	28
Apparently arrested pulmonary tuberculosis	14
Quiescent pulmonary tuberculosis	23
Active pulmonary tuberculosis	32
Total	803

Only five cases of bronchiectasis have come to our clinic. The treatment in these cases has consisted of posture to facilitate drainage along with creosote and menthol inhalations. Artificial pneumothorax and extrapleural thoracoplasty have not been resorted to in any of these patients, although they are excellent methods of treating certain severe cases. Autogenous vaccines have been employed with little or no benefit to the patients.

Bronchial asthma has been a source of considerable trouble among ten students who have reported to us. The treatment in these cases has consisted of expectorants. Forsheimer's solution has been found particularly good not only because of the expectorant it contains, but also because of its

belladonna and laxative content. In a few cases we have had to resort to the hypodermic use of adrenalin chloride and even morphine sulphate during acute attacks. For a time our cases were given the various protein tests and the diet was regulated according to the results of the tests. Later we employed the dietetic treatment beginning with an absolute fast extending over five to fifteen days. The fast is continued until all physical signs have disappeared from the chest. During the period of the fast, the patient takes three or four quarts of water per day and is given an enema daily. When all signs and symptoms of asthma have disappeared, foods are begun in a most cautious manner. On the first day the fast is broken by a glass of orange juice without sugar. On the second day, in addition to orange juice, a small portion of spinach is given. On the third day, lettuce is added. From this time only one new food is added each day. In case any symptoms of asthma appear within six hours after eating, the last food added is eliminated from the diet. We endeavor also to give proteins and carbohydrates on alternate days. By this dietetic procedure we have obtained some very good results in the treatment of chronic cases of bronchial asthma. We have not only been able to keep students in the university when previously they had felt compelled to remain out through certain seasons, but also have several asthmatic patients who have graduated and are holding good positions. These patients state that as long as they regulate their diets carefully, they suffer little or no inconvenience from asthma.

In sixty-seven cases pleurisy was present. In thirty of these cases it was of the acute fibrinous type. The treatment in these cases has consisted of rest, forced fluids, mild laxatives, strapping of the chest or the application of iodine or some other counterirritant. If the pain was very severe, mild narcotics have been employed. Idiopathic pleurisy with effusion has been diagnosed four times. Further study and observation proved that the tubercle bacillus was the etiological factor in three of these cases. Except for diagnostic purposes the fluid was not removed. Sanatorium treatment was advised for the tuberculous cases. Several of our cases of definite pulmonary tuberculosis have also presented pleural effusions.

The ten cases of suppurative pleurisy consisted for the most part of those who had previously been

operated upon or treated by the closed method. They have reported frequently for observation and study. The majority of the twenty-three cases of chronic fibrous pleurisy gave histories of some previous illness to account for their present conditions. A few, however, were entirely unaware of the time when such conditions could have developed.

In 216 cases, tuberculosis has been diagnosed. Five of these cases had tuberculous cervical adenitis. Their treatment has consisted of heliotherapy, x-ray therapy and tuberculin therapy in addition to the usual dietetic and hygienic method of treating tuberculous lesions. In each case we have attempted to prevent the breaking down of the lesions by aspirations as indicated.

There has been one case each of tuberculosis of the bone and soft palate. After confirmation by biopsy, the soft palate case was advised to use heliotherapy. This he did very religiously for nearly a year. Under this treatment, together with dietetic and hygienic regimen, he made very rapid improvement. At the present time he is in excellent condition with a full working capacity.

Two cases of renal tuberculosis had unilateral disease. In each case the tuberculous kidney was removed, after which a long period of anti-tuberculosis treatment was employed. In one of these cases a definite tuberculous focus was discovered in one lung while in the other the lungs appeared perfectly clear. Both of these patients are now working; however, one has been severely handicapped by a chronic arthritis apparently of a non-tuberculous nature.

In sixty-four cases the roentgenologists have reported abnormal peribronchial conditions. Eleven of these cases were reported as having peribronchial infiltration while in fifty-three the evidence was sufficient to justify a roentgenologic diagnosis of peribronchial tuberculosis. These patients have been advised to continue their usual work, lead very well regulated lives and report for observation and study at intervals of about three months. To our knowledge, none of these students have broken down while in school. However, one of them, after graduation and under heavy strain as a pharmacist, developed moderately advanced pulmonary tuberculosis. The subsequent histories of these cases of peribronchial tuberculosis are now being studied together with similar cases from other sources.

Pulmonary tuberculosis in its various stages has been detected in 152 cases. Of these, fifty-seven were classified as demonstrable non-clinical cases. They were carefully observed over considerable periods of time, after which they were advised to continue their school work but to report occasionally for re-examinations. Twenty-eight cases were classified as apparently arrested. Most of these patients had been under sanatorium treatment, consequently they were well trained in the routine procedures in the treatment of tuberculosis. They have all been advised to keep under close medical supervision.

Twenty-three cases were classified as quiescent. Some of these have been advised to go to or return to sanatoriums. Others who have refused institutional treatment have been advised to carry a very small amount of work, lead extremely regulated lives with preponderance of rest and keep under very careful medical supervision.

The thirty-two cases of active pulmonary tuberculosis were advised to discontinue their school work and take special treatment, preferably in sanatoriums. A few of these cases deserve special citation.

A young man of twenty-one years reported for an examination of the lungs because recently we had found bilateral apical tuberculosis in his room-mate. We found in his case more advanced disease than his room-mate had. Sanatorium treatment was discussed at great length and advised strongly. Being a member of the Modern Woodmen of America, he was told that no better treatment could be provided him anywhere than in the Woodmen Sanatorium at Woodman, Colorado. After a few days he consented to make arrangements through his local lodge to go to this institution. We did not see him again until slightly more than a year later when he walked into our clinic. A glance at him told us that he had become much worse. He was pale, weak and emaciated. He said, "I am afraid I have put it off too long." Then he stated that instead of going to the sanatorium as he had planned, some well-meaning friend had convinced him that he would do better if he would go to California and "rough it." He now saw how the advice his friend had given him was not based upon knowledge of the scientific treatment of tuberculosis, but was purely the personal opinion of one who knew nothing of the subject and did not even know that he was taking a human life in his hands. On the second visit we learned that this patient was an ex-service man and that his disability was compensable. He was referred to the United States Veterans' Bureau, where he received immediate attention. Later he was sent to a sanatorium. While there, he wrote us frequently, at one time stating that the Veterans' Bureau had sent him a check for more than \$1,000.00, since at that time disability compensation was retroactive, and that he was receiving his hospitalization in addition to

a monthly check covering his total disability. Finally he became so weak that his letters began to reach us in the handwriting of a fellow patient, and a few months later the chief of the sanatorium medical staff notified us of his death. While in the sanatorium, this student had treatment which could have been excelled in no other institution, yet his disease had become so advanced and so much lung tissue had been destroyed that no treatment could restore him to health or even maintain life. As much as we shall always regret the loss of this young life, we must feel that it might have been continued save for the advice of a well-meaning friend which resulted in postponement of scientific medical treatment.

A student in our medical school came in one day with a high fever and other suspicious symptoms. He gave a history of having lost his only brother from acute tuberculosis a few months before. The history revealed also that he had been losing in weight and strength for a few weeks. Prior to this time when he was apparently in good health he had acted as donor for blood transfusions a number of times. On his first visit he was made a strict bed patient because of symptoms. The examination revealed a massive tuberculosis of the left lung which progressed with extreme rapidity. In addition to the tuberculous process he soon developed a virulent streptococcal infection resulting in bloody fluid in the left pleural cavity. Small amounts of this fluid were removed and replaced with air but with no apparent effect upon the progress of his disease. He died in the course of a few weeks. Three days before death, tubercle bacilli were found in the blood stream. We feel, as do many of his class-mates, that the blood transfusions should not have been given, particularly just after exposure to his brother with acute pulmonary tuberculosis, and while his school work was demanding so much of his time in addition to some outside work contributing to his support. Moreover earlier examination and treatment were indicated because of his slight loss of weight, weakness and temperature elevation.

A young lady was referred to our clinic because of some definite symptoms, including daily temperature elevation. The physical examination and stereoscopic plates revealed evidence of bilateral tuberculosis in the minimal stage. After study and observation extending over a week we strongly advised a period of treatment, preferably in a sanatorium. Some relatives and friends were not of the opinion that tuberculous lesions existed because "there had never been any tuberculosis in the family." They took her to a surgeon who made a fluoroscopic examination of her chest and said, "I wish my lungs were as good as yours." Still the family was dissatisfied. Finally they consulted a tuberculosis expert of more than twenty years' experience who confirmed the diagnosis of tuberculosis and placed her on the proper treatment. The last time we heard of her, she had sufficiently recovered to become a school teacher.

A young woman, aged 20, was a medical student when she noticed that her health was slightly impaired. She weighed 110 pounds. On December 6, 1920, she had a frank hemorrhage. When first seen the daily temperature rose from 101 to 103. Physical signs revealed evidence of pulmonary tuberculosis above the second rib and the third dorsal spine on the left side. Stereoscopic plates showed

a very definite parenchymatous infiltration above the clavicle and in the first and second interspaces on the left side. The sputum contained numerous tubercle bacilli.

This patient refused to go to a sanatorium, but the family promised to follow directions to the letter. She was given the usual anti-tuberculosis treatment, to which was added postural rest. She was an absolute bed patient for four months, during the greater part of which time she lay on the left side. In three weeks the temperature and pulse were normal, the cough had subsided and the expectoration was diminished in amount. The postural rest was continued over a period of four months, after which the patient was started on graduated exercise. The exercise was increased very gradually, and she has been kept under close medical supervision until the present time. Although she did not re-enter the medical school, she completed a college course, received her degree and has recently been employed as a teacher in the public schools.

Another young woman came to the Health Service for an excuse to cover absences from class. The physician to whom she applied, being a close observer, was of the opinion that she was in need of a careful examination. He at once collected a specimen of sputum, the examination of which revealed the presence of tubercle bacilli in large numbers. She was referred to our clinic, where further examination revealed the presence of bilateral pulmonary tuberculosis in the moderately advanced stage. She was advised to discontinue school and return to her physician in her home town with the thought of entering a sanatorium as soon as possible. Her physician, being very co-operative, came to the university and requested that we proceed to get her admitted to a sanatorium. After many months of excellent care in a sanatorium, this patient had so regained her health that she was able to enter the Sanatorium Nurses' Training School, where she is now enrolled as a student, perfectly happy and contented, and working with a vision of being of great service to others.

A young man came in with definite symptoms of active tuberculosis. Physical examination and stereoscopic x-ray plates revealed bilateral pulmonary tuberculosis in the moderately advanced stage. When able, he was returned to his home in Superior, Wisconsin, and advised to consult his family physician. His physician made application to a sanatorium in Wisconsin, where after nine months of excellent treatment he was discharged as an apparently arrested case. Later he returned to the University of Minnesota, where he has recently completed all requirements for admission to our Law School. He is now enjoying good health, but is keeping under close medical supervision and is leading a very well regulated life.

A young woman, recently married, reported to the clinic because of indefinite abdominal pain in the right upper quadrant and pain in the left shoulder and left side of the neck on deep inspiration. The symptoms had been increasing in severity and she had lost both weight and strength for many months but had refused medical aid previously, because she had formerly been and her mother was still a member of the Christian Science Church. Examination showed a right diaphragmatic pleurisy and a very early parenchymal lesion in the right apex. She was advised sanatorium care but dissented on account of her mother's

religious objections. The husband, himself an old sanatorium patient, argued patiently with her for a period of four weeks, during which time her sputum became positive and the pulse and temperature became markedly elevated. She finally consented to renounce her mother's domination and entered a sanatorium. Here she remained for three days until her mother's arguments and absent treatments took effect and she returned to her mother's home. Under a reader's care she was able to forsake her bed and abstain from all rest periods within a period of two days. After two months, however, her studies in Science and Health had not yet enabled her to resume her occupation and it was decided that she could concentrate better in California, whither she was dispatched with only the meager funds her husband could provide while pursuing his studies. At the end of two months more she suffered a change of faith and reported back to the clinic, desiring assistance for admission to a sanatorium. At this time she was found to have lost greatly in weight, the tuberculous process had extended throughout the right lung and into the upper lobe of the left and she was extremely anemic and weak. She was promptly admitted to a sanatorium but before long was enjoying daily visits from her mother and at the end of three weeks signed out of the sanatorium to return to her mother's home. When last heard of she had been divorced by her husband and was permanently confined to her bed.

A man of twenty-three years reported for examination in October, 1920. At this time he complained of severe pains over the left chest. Examination revealed definite evidence of pleurisy, but no evidence of pulmonary tuberculosis. The usual treatment for acute pleurisy pain was administered and an hour or so was spent instructing him regarding the possibilities of his pleurisy being of a tuberculous nature. He was advised to keep under close medical supervision. In January, immediately after the Christmas vacation, he came in with a pale appearance and showing the effects of considerable pain. The examination revealed pleurisy with a small amount of effusion. The amount of fluid increased and in a few days evidence of a very slight pulmonary lesion appeared. Sanatorium treatment was recommended at once. After several months of careful supervision and excellent treatment in a sanatorium, this patient was able to return to the University of Minnesota. He has completely regained his working capacity but he reports frequently for chest examinations.

A man of twenty-two years came in because of some lesions of long standing on one arm. In addition to these lesions he was found to have bilateral pulmonary tuberculosis in the moderately advanced stage. The pulmonary lesions were of a fibroid nature and appeared to be quite old; he was afebrile, and heliotherapy was indicated at that time. He was advised to return to the surgeon in private practice who had seen him previously. The surgeon, after rendering a diagnosis of tuberculous myositis, operated and instituted heliotherapy. The following winter the patient's health was so restored that he went to Florida to obtain an abundance of sunshine. He recently informed us that upon arrival there he secured a position with a sheet metal concern where he was compelled to work eight hours per day in the sun on roofs all winter. He allowed as much of his body to be exposed to the direct sunlight

as possible. The sinuses on his arm which had existed since February, 1921, were completely healed by March, 1922, under heliotherapy and dietetic and hygienic regimen. At the present time he is in the University of Minnesota and has experienced no recurrence of his tuberculous lesions. He is most firmly convinced that heliotherapy played the predominate rôle in the healing of his tuberculosis.

A young lady was referred to us because of a sudden onset of symptoms which were attributed to physical signs of disease over the left upper lobe. She was sent to a sanatorium, where all symptoms subsided on the usual sanatorium treatment in a few weeks. However, in the absence of symptoms the physical signs increased and a good sized cavity appeared in the left upper lobe. There was definite extension of the disease. After a few months of observation we resorted to artificial pneumothorax. An excellent collapse was obtained and at the present time this patient is nearly ready for discharge. She is planning to accept a part-time position on the University campus.

A young man came to the Health Service because of cough and recent slight hemoptysis. Tubercle bacilli were found in his sputum while physical and x-ray examination revealed evidence of a definite tuberculous lesion involving the right upper lobe. This patient was advised to enter a sanatorium, where in due time his working capacity was restored. He was returned to the university, but after a few months suffered a relapse. In addition to hemoptysis, his sputum was found to be strongly positive. He was placed in one of the health service wards and later transferred to another sanatorium. After several months of routine treatment, he had occasional slight hemoptyses, his sputum remained positive and frequent examinations and serial x-ray plates showed very definite extension of his disease with the appearance of two cavities in the right upper lobe. Artificial pneumothorax was advised. Since the first treatment many months ago, this patient has had no hemoptysis or even streaked sputum. He is improving rapidly and soon will be able to undertake light work.

In many other cases which we might cite the findings and results have been very much the same as in those cited. During the four years to our knowledge, only three students who have come under our care have died of tuberculosis. Two of these have already been cited, and the third was a case of acute tuberculosis. The remainder of our cases are either in sanatoriums making definite improvement or have been returned to the university; several have graduated and are now holding responsible positions.

We feel that two great opportunities exist in our clinic. First, that in most instances we see the students before their disease becomes advanced and while they still have splendid chances of recovery. Second, the opportunity for education regarding tuberculosis is unexcelled. The students, for the most part, are at an age when they desire informa-

tion, hence their enrollment in the university. In many instances we have spent hours in answering questions and discussing the prevention and care of tuberculosis with students who have developed the disease, or with their friends and relatives. It is true that not all the seeds sown yield an hundred fold, but we feel convinced that our students who have partially or completely recovered from tuberculosis with sound information regarding the disease, will become influential citizens in their respective communities and will become valuable workers in the campaign against tuberculosis.

STOP YOUR CAR TO LET CHILDREN CROSS STREET

Listen, Mr. Motorist! Have you ever had this experience? You came to a corner and noticed a child, or maybe two or three children, on the sidewalk about ready to cross the street. Have you ever thought of the thoughts that might be turbulently disturbing the little one's mind?

He has been told to be careful in crossing the street, and has been warned of all the dire mishaps that might occur to him. He has been told also that he must get to school on time. The child stands on the corner and when he sees an opening, gets ready to dash across. Then your car looms up like some gigantic ogre barring his pathway. The child darts back to the curbing, almost ready to cry with vexation and disappointment, and no doubt with his heart pounding rapidly.

Now is your chance to prove that you are human! Step on the brake, throw the clutch out and put the gear in neutral; then wave to the child to pass across.

Immediately afterward you will have a remarkable feeling of satisfaction that will more than repay you for the few moments that you may have lost. There is something about a child's smile that cannot be measured in terms of this world's goods.—*Hygeia*.

YADIL BLOWS UP

Yadil was supposed to be an esoteric form of garlic. It was heavily advertised throughout the British Isles and to a small extent in the United States. Then came a bomb in the form of an exposure of Yadil published in a London paper. It was a report of an analysis by an eminent chemist which declared Yadil to consist of 1 quart formaldehyd, 4 parts of glycerin, 95 parts of water and a smell. A second report was from a well known pharmacologist. There were three results from the explosion. The first and most important was that the sale of Yadil almost ceased. The second was an action for libel by the Yadil concern against the newspaper and the scientists. The third was the application by the "patent medicine" concern to prohibit further publications. The injunction was refused. Now the Yadil concern is in bankruptcy and its action for libel has been dismissed by the court. (*Jour. A. M. A., Feb. 14, 1925, p. 520.*)

SOME OBSERVATIONS CONCERNING TIC DOULOUREUX AFTER SIXTEEN YEARS' EXPERIENCE*

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The great difficulty with statistical observations is well expressed by Carlyle when he exclaims, "To Newton and Newton's dog Diamond what a different pair of universes, although the images on the optical retina of both are doubtless the same." Statistics may be the same, while the conclusions drawn from them are often quite different. Statistics may be compared to the straw vote taken before an election. While there is nothing final or positive concerning the deductions taken from straw votes, they may be said to indicate in a general way the trend. In this analysis of 100 cases of tic douloureux we could scarcely claim more significance than for a straw vote.

Incidence.—Of the 100 cases, there were sixty-one females and thirty-nine males, which would indicate apparently that women are more inclined to trifacial neuralgia than men. This inference is also corroborative of our experience with neuralgias in general.

The combined ages of the 100 cases totaled 5,754 years, making the average age of all the patients in this series 50.61 years. There were two cases between the ages of 10 and 20, three between 20 and 30, three between 30 and 40, fourteen between 40 and 50, thirty-two between 50 and 60, thirty between 60 and 70, seventeen between 70 and 80, and one case between 90 and 100. The greatest number of cases (62) is found in the two decades between the ages of 50 and 70. There were only twenty-two cases before the age of 50. The youngest case was seventeen years and the oldest ninety-one. The youngest reported case which has come to our notice was in a boy of ten.

It would seem quite evident that while tic douloureux may occur in all the decades of life, the favorite ones are the sixth and seventh. In other words, it is a disease which is more inclined to make its first appearance in the later years of life. This conclusion would seem to contradict in a way our present conception of its nature. It is described as a typical neuralgia, also as a distinct

*Read before the annual meeting of the Minnesota State Medical Association, St. Cloud, October, 1924.

entity, a disease *sui generis*, which would naturally catalogue it under the functional neuroses. Yet the functional neuroses usually show themselves early in the careers of their victims. When symptoms of a neurosis appear in the fifth or sixth decade, never having manifested themselves before that time, we are extremely suspicious of some organic trouble.

In eighty cases the neuralgia was on the right side of the face; in twenty on the left; in four cases it occurred on both sides; in one case it appeared on both sides at the same time; in the three others at different periods, the intervals varying between one and four years.

Nervous Inheritance.—The factor of nervous inheritance has been inquired into very carefully. In this question of inheritance as an etiological factor, Newton and his dog also applies. In the first place, there is no very definite standard as to what should constitute a nervous inheritance. It would not be unusual for some one desiring to establish his point to find inherited nervous trends in almost every family. We are aware that we might not be entirely free from such criticism. On the other hand, we all know the difficulty we have in getting a history of nervous disease from our patients, for a number of reasons. In the first place, family pride seems to resent it, and almost instinctively they deny the accusation with their first breath. In the second place, patients are not able to identify the various types of inferiority complexes, and associate them with their neuralgia. They never think, naturally, of migraine or epilepsy as having any connection with their neuralgic attacks. As an example: We had injected a patient several times for his tic pain, each time he came, asking him concerning his nervous inheritance, and always receiving a very positive negative. Finally one day he said to us voluntarily, "Oh, Doc, I wish you would give me something for my little girl. She has some kind of spells in her sleep where she jumps out of bed and screams, and we can't wake her up." A little inquiry brought the information that his mother had nocturnal attacks all her life, in which she sometimes frothed at the mouth and fell out of bed. We have included this patient in this series as having a nervous inheritance. If we had written this article two years ago, he would have been left out.

We established to our own satisfaction a posi-

tive neuropathic inheritance in sixty-four of our cases, which is perhaps more than we could do in the same number of cases of epilepsy. As a fair average of these histories, we cite the following case:

Mr. J. K.—Age fifty-three. Father, age 86, in good health. Mother died at age 74, and was subject to neuralgia of the face and head during the last few years of her life. Patient himself has suffered a good deal with sick headaches which were severe in character until the beginning of his neuralgic attacks, when the headaches disappeared.

Relationship to Migraine.—Some relationship has been thought to exist between migraine and tic douloureux. We called attention to this in an article in MINNESOTA MEDICINE, April, 1918. There are a number of cases in this series where, as in the case just reported, when the migraine left off, the tic began. Whether this was merely a coincidence, or indicated a definite relationship, we hesitate to say. It may at least be said to be worth noting.

The following cases are also interesting in this connection:

Mrs. T.—Age 72, father subject to sick headaches, mother subject to nervous headaches in light form. (We are quoting the patient.) Patient herself has never had sick headaches, but has had nervous headaches. Ten years ago began to have a peculiar feeling on right side of face, as of something being alive. It was not until seven years after this that the sharp, spasmodic pains of her tic began.

Mrs. C. S., age 60, never has had migraine, but when her attacks first come on she gets a sensation in her left eye as though it were being pushed out of her head. This is followed by the true tic pains. In this case the description of the sensation in the eye is typical of that given by many patients with migraine. This patient further says she has a small painful area of hypersensitiveness on the third rib in the mid-clavicular region during her attacks, which she often is only able to relieve with hot applications. The symptoms of pain and hypersensitiveness completely out of the area of the fifth nerve, and in that of an intercostal nerve, during an attack are interesting from the etiological standpoint, and quite unusual.

The next case is the most remarkable one we have ever observed in presenting transitional symptoms between the two conditions tic douloureux and migraine.

Mr. J. B. S.—Age 40; watchmaker; no history of migraine or other nervousness in the family history obtained; patient himself a dipsomaniac. For past three or four years patient has had periods of pain such as he now has coming on at varying intervals and lasting from four to six and eight weeks in duration. He rarely suffers with the pain at night. The first thing the patient notices before the onset of an attack is a stiffening on the right side of the neck, followed by a throbbing pain in the right ear and right eye, which is succeeded by a pounding feeling in the right eye, then shooting pains into right forehead and side

of head. This continues at its height for about one-half hour, then gradually subsides. The attack begins with about one period of pain a day, which gradually increases in severity and frequency until the interval is so short between the attacks that he is unable to do anything. Last severe attack lasted about six weeks with a pain-free interval of about three weeks. Present attack began about two weeks ago. He is having now three periods of pain a day. There are apparently no "trigger zones," and eating, drinking, etc., do not bring on an attack.

In this series of 100 cases there were twenty-five who either gave a history of having had migraine themselves, or stated its occurrence in their immediate family (that is father, mother, brothers or sisters). It may not be out of place here to mention that the fifth nerve sends branches to the meninges, so that migraine itself may be only another kind of a manifestation of the pain-producing ability of the fifth.

There were four cases in this series where a history of tic douloureux was obtained in either the father or mother of the patient. One patient stated that his father began with the tic when he was forty and lived until in the eighties. In this analysis the straw vote would indicate that a neuropathic inheritance is an important etiological factor.

Focal Infection.—We have tried to ascertain the rôle of focal infections in the etiology. Sinus disease, nasal abnormalities, and especially the teeth, have often been suspected. The usual method of dealing with them might be termed the Chinese plan, since the Chinese, when a crime is committed, hold the neighbors responsible. The teeth have generally received the death sentence first, then the nose, and next the antrum. There has been no single structure in the anatomy of the face which has escaped condemnation. One of the series had had twenty-two separate operations on his face, the climax being reached with the removal of the right superior maxillary bone. Sixty of the patients had had one or more operations about the face. In only one case was there even temporary relief as a result of these surgical procedures. This occurred after the removal of a tooth, but the pain in this case returned later. In a number of cases the origin of the pain seemed to the patient to have been connected with carious teeth, but the removal of these teeth gave no relief. In the 100 cases there was really no direct proof that focal infection played any part as an etiological factor. The removal of every single suspicious source made no improvement.

Two cases were luetic, but the lues seemed to be incidental rather than etiological.

There was also no evidence in any of the cases of a connection between a general infection and the beginning of the tic douloureux.

Menstruation.—In the women of menstrual age, some were of the opinion that at the menstrual period they were more apt to have pain; others were quite positive their menstruation made no difference. In a few cases the pain began soon after the cessation of menstruation. In one case the pain came only at this time, and during two pregnancies the patient was entirely free from tic pain. This is of course interesting, but not definite enough to be very instructive.

The Nature of Tic Douloureux.—Thus far our inquiry as to the nature of tic douloureux has been successful chiefly in being able to state what it is not, rather than what it is. All our experience with it would indicate that it is a neuralgia and not a neuritis, yet the most of our treatment has been that of a neuritis. A neuritis signifies an inflammation with always a very definite and positive pathology. A neuritis is an organic disturbance with objective symptoms. A neuralgia is something entirely different. A neuralgia is a functional disturbance with no objective symptoms. M. Lapinsky says, "We are accustomed to designate as neuralgias the pains which are limited to the region of a certain nerve. These pains manifest themselves in attacks, reach in these attacks their height, and are followed by a pain-free interval." According to the opinion of Hardy, Valleix, Fernet, Axanfeld, Huchard, Romberg and others, since no objective symptoms have been determined by examination in the strength, the reflexes, the sensation, and the nutrition of the musculature in the area of distribution of the affected nerve, since no pathology has been found in the nerve fibres themselves, neuralgia has been classified under the functional neuroses.

The symptoms of tic douloureux conform perfectly to this description of a neuralgia. The symptoms are all distinctly subjective in character. So far as we know not a single objective symptom has ever been reported. No change in the strength, sensation, or nutrition of the parts supplied by the fifth nerve has ever been observed. We have had the opportunity of observing cases repeatedly of ten, fifteen and twenty years dura-

tion. In these cases in the interval between the attacks not the slightest disturbance of function was ever noted. The symptoms always answered to the description of a neuralgia. There was never any evolution or progression of them into anything else. The problem of their tic pain was from beginning to end the problem of neuralgia in general.

Frazier says the condition which in his opinion most resembles trifacial neuralgia is the so-called gastric crisis. The analogy is a very good one. Like tic douloureux the disturbance comes in distinct attacks with free intervals of months and years. During these intervals the stomach performs its function perfectly. The distress during the attack is often intense. Practically the same symptoms manifest themselves in the attack, again and again, and the attacks, especially in the functional cases, remain unchanged in nature over periods of years.

There are many other conditions of a strictly functional nature which resemble trifacial neuralgia. In hay-fever or asthma we are able to observe many points of similarity—the attack-like nature, the free interval, the absence of local pathology, etc. But in hay-fever and asthma we now know the symptoms are caused by a constitutional anaphylactic reaction in the patient to certain proteid substances, notably the various pollens.

Migraine is doubtless another such reaction, although the nature of the anaphylactic factor has not been determined as in the case of hay-fever.

It is interesting to observe that the symptoms of all three of these conditions are but different reactions in the distribution of the fifth nerve.

It is also worthy of note that, although we know absolutely that hay-fever is a constitutional anaphylactic reaction, the anaphylactic symptoms occur in the same structures over and over again, which suggests the probability of the so-called conditioned reaction. This suggestion applies equally as well to migraine and tic pain.

In fact, when we get right down to brass tacks, as General Dawes expresses it, there is no condition of which we know anything about, presenting similar symptoms, periodicity, free intervals, without pathology, that is not constitutional and also doubtless anaphylactic in character.

The Sympathetic System.—Frazier has made a suggestion in connection with trigeminal etiology, which is stimulating especially at this time since

the sympathetic system in its relation to causalgias, angina pectoris, and other conditions especially vascular and painful in nature, is receiving so much attention. In an article on neuralgia of the face he says, "Looking for a parallel in other nerve tracts, we are reminded of the burning sensation in causalgias of the median nerve, and of the relief afforded by the Leriche operation on the periarterial sympathetic plexus. With this in mind we selected from our series a patient who complained of a burning sensation in the gums, a sense of pins and needles in the face, and a burning sensation below the eye. With a view to determining what effect sympathectomy would have, the superior cervical sympathetic ganglion was removed, and the periarterial sympathetic plexus stripped from the common carotid artery on the affected side. The operation relieved the burning feeling in the cheek, and the dry feeling in the eye disappeared." He significantly adds, "We hesitate to speculate as to what influence this operative result may have on our solution of some of these intricate problems." Such questions arise as to whether the etiology of tic douloureux does not lie entirely in the sympathetic system, the fifth itself being only the innocent pathway; also whether the pain originating in the sympathetic system and that coming from the cerebro-spinal system may not have distinctly differentiating qualities. There are a host of interesting questions which arise, but we must stop wondering before we illustrate too vividly the vast difference in the two universes between Newton's eyes and his dog Diamond's.

Duration.—The average length of time the tic had existed in the 100 cases was 6.67 years. This period varied in the different patients from a few months to twenty-five years. It seems to us that in the duration of tic pain over such long periods of time without any essential change in its nature there is to be found one of the strongest arguments against its neuritic and infectious character, and in favor of its functional origin. Such a neuritis as the symptomatology of tic douloureux presents has never been observed elsewhere. Actual disease either progresses or recedes. A functional nervous disturbance may go on indefinitely, especially if the disturbed function only recurs at intervals.

Alcoholic Injections.—All of the 100 cases were treated by alcohol injections according to the

method of Levy and Boudoin, sometimes called the external method, where the point of entrance of the needle is through the skin of the face, and each branch of the fifth is reached from different locations. Three hundred and thirteen injections were given in all, some of these injections being superficial, that is—made at the point of exit of the supra- and infra-orbital branches of the first and second divisions of the fifth and the infra-dental branch of the third division. The majority of the injections, however, were deep—that is, made at the points of exit of the second and third divisions of the nerve where they emerge from their respective foramina—the foramen rotundum, and ovale at the base of the skull. Thirty-nine injections were made in twenty-five patients who did not return, so the duration of their relief is unknown. Two hundred and seventy-four injections were made in seventy-five patients. In forty-four of these patients two or more branches of the fifth were involved so that at least two injections had to be given, no matter how good a hit of the nerve was made. The seventy-five patients received 3.65 injections apiece, and obtained a total of 753 months' relief, an average of a fraction over ten months per patient.

Of the 100 patients there was only one who gave us a fair trial—that is, an opportunity to hit the nerves affected—who did not obtain relief from his pain. In this case the trigger zone apparently was around the eyes, involving the cornea and conjunctiva in the distribution of the first division. Here we failed completely.

As an example of the relief the alcohol injection gives in the average tic pain case over a period of years, the following case will give one a good idea:

Mr. M. P.—Age 50, janitor, had a tic pain in the second branch of the right fifth nerve. Patient's home is in St. Paul, so when he gets a return of his pain he comes at once for an injection. He was first injected February 7, 1918, then April 9, 1919, September 21, 1920, June 2, 1922, February 22, 1923, and the last time June 21, 1924. Over a period of six years this patient has had six injections, and during the entire time has been rendered practically pain-free by them. In individual patients the relief period in this series has varied from a few weeks to ten years. The case cited above, however, is representative of the relief the usual case may expect from treatment by alcohol injection.

There were no fatalities or serious accidents as a result of the injections. In a few cases hemor-

rhage was troublesome, especially into the orbit. In one case the bleeding into the orbit was so profuse that the ball of the eye was pushed partially out of the socket. In this case a temporary blindness, lasting several hours, resulted, occurring apparently from the pressure of the hemorrhage on the optic nerve. In one of the cases where the pain was on both sides of the face, involving on each side the third division, the injection caused, as one might expect, a paralysis of the internal and external pterygoid muscles and a dropping of the lower jaw. This patient had to keep her jaw tied up for several weeks.

In this series, four of the patients, and the only ones so far as we know (there may have been others) submitted to the operation for the avulsion of the posterior root. Three were operated on by skilled neurological surgeons. Two died within forty-eight hours after the operation, and two within a week. Of these cases, two were under sixty years of age and in quite good physical condition, and two were over seventy and their general condition was feeble. We realize of course that the 100 per cent mortality of these four cases does not represent at all the very low mortality of the present avulsion operation, but since these cases come in the analysis of this series we mention them.

Summarizing our analysis of these 100 cases, we find:

1. Women much more frequently affected than men.
2. The majority of the cases appeared in the sixth and seventh decades.
3. The involvement of the right side of the face was four times as frequent as the left.
4. Evidence of a distinctly neuropathic inheritance in 64 per cent of the cases.
5. Absence of any evidence to indicate focal infections as an etiological factor.
6. No reason to consider tic douloureux as a neuritis, but rather as a true neuralgia, and belonging with the neuralgias under the classification of the functional neuroses.
7. And finally that the alcohol has stood the test of time and gives relief for the pain in tic douloureux indefinitely when the injections are repeated, without practically any danger of serious accidents or unpleasant complications.

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DISCUSSION

DR. A. S. HAMILTON (Minneapolis): I think Dr. Ball's reference to Newton and his dog and what they, respectively, saw is very well applied to his presentation as respects the treatment of tic douloureux in the hands of the surgeon, on the one hand, and of the one who uses injections of alcohol on the other hand. Only, he modestly avoids telling us which represents the dog.

There has been considerable literature on this subject in recent years and Cushing, in particular, has insisted that the radical operation for tic douloureux, in his masterly hands, is practically without fatality. At the same time, he has referred to a number of very unhappy complications that have been seen among the patients submitted to him for operation and who had previously undergone the alcoholic injection treatment. It seems to me, however, that there are certain very important points for consideration before we determine the relative merits of these two procedures. There are three men in the United States at present, Cushing, Adson and Frazier, who have particularly distinguished themselves in the surgical treatment of tic douloureux, but what these men can do in the way of operative treatment, of course, cannot be done by every other man who chooses to operate and for Cushing to compare his results with those seen as a result of alcoholic injections, doubtless done many times by individuals who were illy prepared for the work, is hardly fair to either procedure. If one is to make comparisons at all, one should compare the results of masters, such as Cushing, with the experience of those who have carried on the alcoholic injections treatment for a long time, as has Dr. Ball, with such distinguished success.

Dr. Ball has covered the whole subject of tic douloureux fully in his paper and has spoken of the fact that in this condition we are dealing with a neuralgia, not a neuritis, and that there are no objective signs.

From Cushing's clinic, we have had a study of a number of Gasserian ganglia where operation has been done on the peripheral nerve and, in all these cases, there was a change in the nerve cells of the ganglion, but in all those instances where no surgical procedure had been carried out, there was nothing to be found in the ganglion, and it was the opinion of Bailey. I think, that the lesion was in the end organs of the nerve. Of course, there is no absolute proof of this statement and not everyone would agree with it.

In the discussion, it may be opportune to refer to some of the problems in diagnosis of tic douloureux. Dr. Ball referred to one case in which he had been unable to secure relief, even when the patient submitted fairly to treatment.

I wondered if that might possibly refer to one of those cases which Sluder has popularized, known as sphenopalatine ganglion syndrome. I have heard Sluder describe it and think it is generally accepted that the syndrome he developed is fairly well founded. The difficulty about it lies in his inclusion of such an enormous number of symptoms, that it becomes difficult to see how they can all arise out of one locality, and one wonders whether the anatomical basis of his syndrome is well established.

In this particular case Dr. Ball spoke of the pain about the eye, and Sluder refers to that especially. It is a matter of record also that there are cases where the alcohol injection or radical surgery has been carried out without relief, and where Sluder's procedure has later effected a cure, and vice versa, so that the error in diagnosis is certainly a possible one.

In any case of typical trifacial neuralgia, the diagnosis is easy, but the cases are not all typical. There are cases of herpes, for example, where diagnosis is difficult, but in these there is a burning pain, the pain does not spread to other branches and there are no typical paroxysms with spasmodic contraction of the face.

Dr. Ball referred to the relation of migraine to tic douloureux and there are cases of constant pain in the face which have been mistaken for tic douloureux; but a constant pain at once denies the idea that these cases belong in the group of neuralgia, for a neuralgia, necessarily, has an intermittent pain. Also, there are cases of constant pain where pressure is exerted on the fifth nerve and also in cases where a tooth is involved. These have been mistaken for trifacial neuralgia. Then, there are cases of purely functional origin.

In all these groups, the diagnosis has been mistaken at times and I think anyone who deals with trifacial neuralgia or like conditions will admit having had trouble at times.

Even if one looks at these cases through the eyes of the most enthusiastic surgeon, I think one must admit that, in cases of trifacial neuralgia, where only one of the lower branches of the fifth nerve is involved, it would be proper to submit the case to alcoholic injection and, if the result is satisfactory, one might go on with that procedure. On the other hand, I think almost anyone will admit that in these cases where all the divisions are affected, where the case has proved intractable when treated by alcoholic injection and relief cannot be obtained, or is only temporary, one should resort to radical surgical procedure, assuming that the case is a good surgical risk.

One of these cases of Dr. Ball was an individual I sent him some years ago. He was an old man and got along very satisfactorily for five or six years, with intervals of relief of at least one year on the average. Finally, he developed melancholia and went south and some of his friends induced the family to believe that the melancholia was due to anxiety over this recurring pain and that to have an operation on the fifth nerve would be to recover from the melancholia. The patient submitted himself to operation at the hands of a most acceptable surgeon and died three or four days afterward. This constitutes no charge against radical operation as the man was really an unsuitable risk, but, if one is to make comparisons between the results of alcoholic injection and surgical operation, I think

it should be on the experience of such men as Dr. Ball and such men as Dr. Cushing, and we should not accept the results for comparative purposes of everyone who has chosen to do this alcohol injection.

DR. J. P. SCHNEIDER (Minneapolis): Dr. Ball's large series of cases and his method of treatment is well known to most of us, and personally I have, up to the past few years, gladly sent these patients promptly to Dr. Ball for treatment.

However, in the last several years, we have discovered that in elderly patients with tic douloureux who are edentulous, the bizarre movements and displacements of the inferior maxillary bone can produce trauma of the inferior dental branch of the fifth nerve and lead to this factor being the trigger which sets off the tic attack.

In this type of case we have had three very excellent results at the hands of Dr. Everett E. MacGibbon by properly built-up plates, preventing this trauma. I wish to draw your attention to this type of case, for the solution is a very happy and permanent one.

DR. CHARLES R. BALL (concluding): Members of the State Medical Society: First, let me acknowledge my indebtedness to our Chairman, Dr. Tuohy, for the technique of preparing the radio mats. Knowing that he had information on all things, especially relative to medical affairs, I applied to him for information, and received from him a full description of the method of preparing these radio mats for presentation.

Answering the question of Dr. Hamilton as to whether these cases in which I failed to relieve by injection were in the region of the sphenopalatine ganglion, I will say that the trigger zone area in these cases seemed to be in the distribution of the first branch in the conjunctiva and especially the cornea of the eye. I have found in my experience where the trigger zone lies in this location that it is very difficult to attain an anesthesia sufficient to shut off the pain-stimulating impulses.

Dr. Michael's point, concerning the ages of these patients being against the assumption of a functional neurosis, is a good one. Functional neuroses do not usually make their first appearance after fifty years of age. The answer to this argument is simply that functional neuroses very often change in their symptomatology, and that tic douloureux in these later decades is merely a transformation of some other neurotic disturbance which existed in the earlier years of the lives of these patients.

In regard to other treatments for the relief of the tic pain, for the past year we have been experimenting with different things. We have, of course, used the strychnine and aconite, but in our experience these treatments have proven to be uncertain and unsatisfactory. Recently we have tried out the effect of protein injections, using, in the first instance, peptone, and later milk injections because the peptone did not give a marked enough reaction. But in none of the cases treated so far has there been any result obtained worth reporting.

ZINC SALTS IN GONORRHEA

The so-called zinc borosalicylate preparations which are at present being exploited for the treatment of gonorrhea are not new. Such a preparation was exploited in Germany ten or fifteen years ago under the name of "Dr. A. Foelsing's Mucosan"; analysis made about that time threw doubt on the claim of its being "a definite compound"; rather, under the scrutiny of German chemists, the product seemed to be a loose combination of zinc salicylate, salicylic acid and boric acid. Recently, there has been an active campaign to influence American physicians to use the product, this time under the proprietary names of "Neisser-San-Kahn" (York Laboratories, York, Pa.) and Zinc-Borocyl (Al Sano Chemical Products, Chicago). Both are recommended for genito-urinary work, particularly local infections of the urethra. The Council on Pharmacy and Chemistry, in its reports on these two products, stated that the submitted evidence failed to show that the preparation claimed to be zinc borosalicylate has any advantage over established zinc salts; that zinc sulphate is indicated in only certain forms of urethritis; and that the use of substances that are unessential modifications of established drugs is unscientific, serves no useful purpose, and is not in the interest of rational scientific therapy. (*Jour. A. M. A., Feb. 28, 1925, p. 696.*)

"ORGAN-O-TONES"

From the advertising, it appears that the Cole Chemical Co. is engaged in the marketing of "shotgun" mixtures, largely of the "pluriglandular" type. For a year or more it has been "pushing" a mixture "for obesity" designated "Organ-O-Tones No. 19." The preparation is marketed in capsules which have been stated to contain: "Thyroid Substance" $\frac{1}{2}$ gr., "Pituitary (whole)" $\frac{1}{4}$ gr., "Phytolacin" $\frac{1}{2}$ gr., "Apocynum (P.E.)" $\frac{1}{4}$ gr., "Organ-O-Tones No. 12" (composed of sodium bicarbonate, potassium bicarbonate, calcium glycono-phosphate, calcium phosphate (di-basic) and magnesium phosphate $3\frac{1}{2}$ grs. It is evident that Organ-O-Tones No. 19 for Obesity is an irrational mixture which depends for its action as an "obesity" remedy on the thyroid which it contains. The firm's advertising does not stress the formula and hence it is probable that those who use this preparation do so without full appreciation that they are administering thyroid. More than sixteen years ago, Reid Hunt and Atherton Seidell called attention to the misuse of thyroid as an ingredient of "antifat" nostrums. Since then the ill effects of thyroid as an anti-fat have become well established. Recently H. S. Plummer and Wm. Boothby warned against the uncontrolled use of thyroid in obesity. (*Jour. A. M. A., Feb. 28, 1925, p. 698.*)

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION,
SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN
MINNESOTA MEDICAL ASSOCIATION, AND MINNE-
APOLIS SURGICAL SOCIETY

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its

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All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of \$1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VIII

APRIL, 1925

No. 4

EDITORIAL

The State Meeting

This year's annual meeting comes so early in the year that it is hard to realize that the month of the meeting is actually upon us. The program committee and the committees on arrangements, however, have been at work and the program which appears in this issue under Society Meetings indicates that an unusually fine program has been arranged.

A medical convention is often the occasion for attempts at sensational announcements of medical news by the newspapers. The appointment of a publicity committee in connection with the Minneapolis meeting is a wise move and it is to be hoped that all newspaper publicity will be handled by this committee and that individual members approached by reporters refer them to members of the committee.

The officers of the component county societies have had too little recognition at our state meetings. The county societies after all make up the state association and in a sense the officers of the component societies are state medical officials. In recognition of this fact President Burnap is contemplating official recognition of the county presidents and secretaries. He is particularly desirous that the county officers be present at the Monday night meeting when subjects of great practical importance to the profession at large—and this means the county societies—will be presented. It is planned to have a roll call of the county secretaries at this particular meeting.

The combination of Minneapolis Clinic Week with the State Meeting this year and the emphasis being laid on clinical demonstration in the State program will afford abundant opportunity for those in attendance to see a variety of clinical cases.

Let's make this year's meeting a record breaker in attendance. The program warrants it.

Education of Future Dentists

By the publication of a recent report* of the Dental Faculties' Association of American Universities, the work of this important association in the advancement of the standards of dental education in this country between the years 1908 and 1924, has become available. Viewed thus in retrospect, there are evidenced very marked changes in dental school curricula. The tendency of these changes has often aroused discussion as to whether it would not be better, after all, to make the same requirements for prospective dentists as those made for prospective physicians, and many prominent leaders and educators in both the medical and dental professions openly advocate fusing the dental and medical schools and making the practice of dental surgery a specialty in the practice of medicine.

The problem presented by these proposals is not simple of solution. On the one hand, largely based upon expediency, are presented the arguments for a comparatively short period of professional study, thus saving expense and time to the dentists and perhaps expense also to their clients. It is true that considerable work required of professional dentists is largely mechanical and does not demand any profound educational qualifications except that of experience. This is true, however, of every other profession; and such work in all professions, and even today in that of dentistry, is being carried on either by those in the profession who have a partic-

*Minutes and Proceedings of the Dental Faculties' Association of American Universities, 1908-1924, University of Minnesota.

ular aptness for that sort of work or by well trained non-professional assistants.

Through the whole discussion stands out, in prominent relief, the basic fact that lesions in or around the teeth have as fundamental a significance for the general health of the individual as have those in almost any other part of the body, and, consequently, that judgments in regard to the proper prophylactic care and treatment of the diseases of these tissues must be made with due regard to the general health of the individual as a whole. Many doctors of dentistry have succeeded in an admirable way in meeting these new demands on their profession, but those who have not received due training in general medicine, have often found themselves at a disadvantage in problems which vitally concern their patient's welfare.

That the education of dentists as well as that of medical students is undergoing a rather profound evolution there can be no doubt. That to a certain extent this evolution will be beyond the foresight or control of the present generation must also be admitted. However, wise counsel and sane judgments may prevent some mistakes. We are particularly impressed by the broad viewpoint of those who are at present in control of dental education in this country.

H. E. R.

Periodic Health Examinations

One's earliest reaction to a general program to bring about these routine investigations of large groups of people (including the apparently healthy) is apt to be unfavorable, but as one analyzes the unfavorable features involved, it becomes clear that most of them arise from defects within the profession, rather than anything intrinsic in the plan itself. For example, the physicians who have never schooled themselves in routine or who have long abandoned it in the scramble of looking out for immediate complaints, are going to miss the whole idea and give the lay applicants who seek these examinations nothing for their trouble except the remark that they should "forget it."

Then over and against this skepticism of physicians who see enough trouble without digging for it, comes the equally obvious fact that misdirected routine is likewise often fruitless. Skilled routine is at its best only when directed by a good sense of proportion, likelihood, and the "law of averages." Subjective disorders (so often the fore-

runner of definite disease entities) are so likely to be passed over and neglected in the zeal "of a search for the obvious." Fully seventy-five per cent of the patients consulting the average doctor come with *subjective complaints*. All too often we are not much interested and show it all too plainly. Often this lack of interest comes from a lack of familiarity and knowledge. No fitting public appeal for "General Health Examinations" can be made before we agitate these principles among ourselves. Life insurance examinations have been made for many decades, but is it not a fact that they are all too perfunctory and very often fail to reveal the true facts involved? Health examinations on a big scale are surely coming. Are we broad enough to adapt ourselves to the needs and humble enough to master the technique of the essentials involved?

E. L. T.

Life Extension Institute

In 1909 Dr. Burnside Foster, then editor of the St. Paul Medical Journal, in an address delivered before the Life Insurance Presidents Association, recommended the physical examination of insurance policy holders every five years and predicted that the lowering of mortality rate would more than cover the cost. Although the idea was considered rather fantastic at the time, Dr. Eugene Lyman Fiske, then Medical Director of the Provident Saving Life Assurance Society, was impressed with the idea and instituted yearly examinations of policy holders in his company. Several thousand availed themselves of the opportunity, a sufficient number to demonstrate that such a procedure was a money saving proposition to insurance companies and a life saving proposition in general.

As a result of this experience the Life Extension Institute was organized in 1913 on a semi-philanthropic basis with sufficient business aspect to insure efficient management. The project was backed by Mr. Harold A. Ley in a financial way and moral support was rendered by such men as Professor Irving Fisher of Yale University, William H. Taft and a number of prominent physicians in the East. The main purpose of the Institute was to detect morbid processes early through periodic examinations in order to prolong life. This should be a service both to the individual and life insurance companies associating themselves with the Institute. The Metropolitan Life Insurance Company associated itself with the Institute from the start and its experience

was such that other insurance companies to the number of forty have been enrolled.

In the supplementary report of the Judiciary Council of the A. M. A. rendered at the last meeting of the Association at Chicago in June statements were made regarding the activities of a commercial periodic health examination institution, obviously the Life Extension Institute, which were either intentionally or otherwise incorrect. In brief, this report accused the Institute of paying a nominal fee to their examiners and selling the information thus gained to the insurance companies. It was stated that industrial houses were informed by the Institute of the physical condition of employes whose examination could be arranged for by contract. It was further claimed that the Institute was organized for commercial gain and stated figures purporting to show the Institute was making large profits.

The Board of Directors of the Life Extension Institute in answer issued a statement which was sent to the A. M. A. headquarters in which the statements of the Judiciary Council above mentioned were flatly contradicted. Communications as to the physical condition of those examined are held in the strictest confidence and a statement of the financial status of the Institute indicates clearly that it has not been a money-making proposition. There was a deficit of nearly \$200,000 during the first five years of the life of the Institute and it was not until 1923 that a small dividend of $3\frac{1}{2}$ per cent was paid and this on the preferred stock only. For every share of preferred stock issued three shares of common stock have been issued and two of every three shares of common stock have been turned over to the Honorable W. H. Taft and Professor Irving Fisher as trustees under an agreement that any dividend which may be paid on this stock shall be devoted to philanthropic public health work.

The reputation of the individuals sponsoring the Institute is such as to warrant belief in the honesty of the project. It seems unfortunate to say the least that the A. M. A. report so twisted the facts as to produce such an unjust conception.

Viewed from an impartial standpoint the Institute is rendering a definite service by furthering the cause of periodic physical examinations. While we as physicians have recognized the importance and value of such examinations we have not been in a position to push the idea. As a matter of fact, we as a profession have been slow to get the view-

point of the so-called health examination. Trained to interpret subjective and objective symptoms we have been slow to grasp the importance of early detection of errors in personal hygiene and the beginning of morbid physical processes.

On the other hand there can be no question but that, given two equally efficient physicians, the one who personally examines an individual is better able to prescribe than the one who simply examines another physician's report. The distant examiner is only too likely to prescribe diagnostic procedures such as the electrocardiogram, x-ray of the heart, glucose tolerance test, etc., which look well on paper but are impractical and unwarranted in many cases.

If there is a need for such organizations as the Institute to sell the idea of periodical examinations to the public then the Institute is on the right trail when it directs the individual to his own physician for investigation along certain lines and gives specific directions as to matters of personal hygiene. Suggestions as to diagnostic procedures and medical and surgical treatment advisable in any case might well be left to the local adviser.

The Life Extension Institute is the largest of the concerns conducting so-called health examinations. Numerous other organizations have been flourishing during recent years, some of which limit themselves to quarterly urinalyses and instructions regarding personal hygiene. Some of these organizations are purely money-making schemes and broadcasted circulars contain preposterous statements to catch the gullible. The examination in some is limited to quarterly urinalyses and the elaborate reports are in large part worthless and confusing. Such organizations cannot be too severely condemned.

What is the solution of the entire proposition? The value of the periodic physical examination has been generally recognized by the profession as well as the public. The health examination forms painstakingly prepared by our A. M. A. committee should be convenient and useful to all physicians likely to be called upon to render such examinations, and 100 forms may be obtained from headquarters on remittance of the modest sum of seventy-five cents. The patient fills in one side of the form previous to the examination, which is greatly facilitated thereby. The form serves also to standardize the examination and is an aid in carrying out a thorough examination. Here is a practical way in which we can meet the situation.

OBITUARY

DR. DAVID OWEN THOMAS

Dr. David Owen Thomas was born in Wales, Nov. 21, 1852, and came to the United States at the age of nineteen. His high school education was obtained in Wales and his college degree at Bethany College, West Virginia, in 1878. At this time he was studying for the ministry. After this he studied medicine at the Medical College of Indiana, from which he was graduated in 1884. He did post-graduate work in Columbia University and at St. Bartholomew's in London. He was a member of the Royal College of Surgeons and of the London Royal College of Physicians.

Previous to coming to Minneapolis, he had practiced in Knightsville, Indiana. He practiced medicine in Minneapolis for many years, and at one time was teaching in the Medical Department of Hamline University. He was a member of Asbury Hospital staff, and of the County, State and American Medical Associations. He was president of the Hennepin County Medical Society in 1905, and chairman of the Board of Censors for many years.

While he was a medical student in the Medical College of Indiana he won the gold medal for competitive essay with a treatise on cesarean section.

Dr. Thomas was a very active member of Disciples of Christ Church and had a national reputation as a scholar in biblical research. He had gathered a library of unusual significance, containing rare and valuable manuscripts and books not often found outside of great libraries. He imported many books for his special study. He not only read in his native tongue, Welsh, but also in Greek and Hebrew.

Dr. Thomas died after an acute illness following a period of ill health of several months' duration, at his home on February 11, 1925. Mrs. Thomas was absent at the time of his death, returning from a trip around the world. They had planned to meet in the early summer at Dr. Thomas' birthplace in Wales and return to Minneapolis together.

DR. E. L. MANN

Dr. E. L. Mann of St. Paul died suddenly March 14th at the Edgewater Beach Hotel in Chicago. He was on his way home from Savannah, Ga., where he went in December for his health.

Dr. Mann was born in St. Paul in 1861 and practiced his profession in his native city. He attended Hobart College, Geneva, N. Y., and the Hahnemann College of Medicine at Philadelphia, where he received his medical degree. After graduation he studied in Berlin and Vienna, specializing in ear, nose and throat diseases. For a time he was Dean of the homeopathic department at the University of Minnesota medical school until it closed about fifteen years ago.

Dr. Mann was a member of his county, state and national medical societies, a member of the Town and Country club and was held in esteem by his confreres and fellow citizens.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

An unusual and valuable feature of the annual meeting of the Minnesota State Medical Association, to be held at the University Medical School, Minneapolis, April 27, 28 and 29, will be the "Medical Economics" session, to be held at the Anatomical Auditorium the opening night of the meeting.

"Periodic Examinations," which at the present time are being advocated by the health organizations of the country, will be discussed from the standpoint of the physician by Dr. Frank Billings, former president of the American Medical Association.

The rest of the Monday night program will be given over to discussion of the various phases of medical defense by national and state authorities, including Dr. W. C. Woodward, chairman of the Judiciary Committee of the American Medical Association; Dr. E. Starr Judd of the Mayo Clinic, and Mr. Fred E. McLucas, attorney for the Medical Protective Company, Fort Wayne, Indiana. The complete Monday night program follows:

Periodical Medical Examinations—Dr. Frank Billings
 Medical Defense—Dr. W. C. Woodward
 Don'ts for Malpractice—W. H. Oppenheimer of the
 State Association's Legal Firm
 National Defense—Major Irving M. Madison
 Corrective Legislation—Fred E. McLucas
 State Legislation—Dr. H. M. Johnson
 Substitute Medical Defense—Dr. E. Starr Judd

The usual meeting of the Council of the Association will be held Monday morning and of the House of Delegates in the afternoon.

Dr. W. D. Haggard, Nashville, Tenn., president of the American Medical Association, will be among the out-of-state speakers on the program. He will give a clinical demonstration in the Medical and Surgical Joint Section to be held Tuesday morning, and will be the principal speaker at the Tuesday night banquet to be held at the Radisson Hotel, Minneapolis. Other speakers at the banquet will be: Dr. W. J. Mayo, who will act as toastmaster; Dr. Frank Billings, Governor Theo. Christianson, Mayor George Leach of Minneapolis and Dr. Willard L. Burnap, president of the Minnesota State Medical Association.

Hotel headquarters for the meeting will be at the Radisson, where the visiting physicians will be entertained at a smoker Wednesday evening by the Hennepin County Medical Society.

Thursday, April 30, will be Clinic day and a series of Clinics, part of Minneapolis Clinic Week, will be conducted by members of the Hennepin County Medical Society. A golf tournament to be held Monday is an additional feature.

Special effort has been made this year to work out a well-rounded program which will be of value and interest to every physician in the state, and a large attendance is urged. That physicians make a special effort to arrive

for the Monday night meeting is the request of those in charge of the program.

Roll call of the secretaries of the Component Societies will be held Monday night.

Among those who are active in arrangements for the meeting are the following:

Dr. W. L. Burnap, President, Fergus Falls
 Dr. W. A. Jones, Hennepin County Clinical Section
 Dr. W. A. O'Brien, University of Minnesota
 Dr. F. A. Erb, Chairman of the General Arrangements Committee
 Dr. Emil Geist, President Hennepin County Medical Society
 Dr. Harry Ritchie, Chairman Surgical Section, M. S. M. A.
 Dr. O. J. Hagen, Secretary Surgical Section, M. S. M. A.
 Dr. L. G. Rowntree, Chairman of the Medical Section, M. S. M. A.
 Dr. F. J. Hirschboeck, Secretary of the Medical Section, M. S. M. A.
 Dr. A. S. Hamilton, Vice President, M. S. M. A.
 Dr. John Libert, Vice President, M. S. M. A.
 Dr. C. W. More, Vice President, M. S. M. A.
 Dr. E. A. Meyerding, Secretary, M. S. M. A.

SCIENTIFIC PROGRAM

TUESDAY, 8 A. M., APRIL 29, 1925—

Joint Session, Medical and Surgical Sections. The University Campus.

1. Clinic on Tumors of the Lymph Glands
 - (a) Clinical Presentation—Medicine. Dr. J. P. Schneider, Minneapolis
 - (b) Surgical Demonstration. Dr. Harry B. Zimmerman, St. Paul
 - (c) Roentgenologic and Radium Treatment. Dr. A. S. Fleming, Minneapolis
 - (d) Pathological Demonstration. Dr. E. T. Bell, University of Minnesota, Minneapolis
2. Clinic on Bone Tumors
 - (a) Clinical Presentation. Dr. H. W. Meyerding, Rochester
 - (b) Pathological Demonstration. Dr. W. C. McCarty, Rochester.
3. Tumors of the Breast
 - (a) Clinical Demonstration. Dr. W. D. Haggard, Nashville, Tenn.
 - (b) Pathological Demonstration. Dr. W. A. O'Brien, University of Minnesota, Minneapolis

WEDNESDAY, 8 A. M., APRIL 29, 1925—

Joint Session. Medical and Surgical Sections. The University Campus.

1. Diabetes Mellitus
 - (a) Clinical Demonstration. Dr. A. H. Beard, Minneapolis
 - (b) Surgery in the Diabetic. Dr. A. A. Law, Minneapolis

2. Diseases of the Thyroid
 - (a) Clinical Demonstration. Dr. H. S. Plummer, Rochester
 - (b) Surgical Consideration. Dr. J. deJ. Pemberton, Rochester
3. Diseases of the Other Glands of Internal Secretion. Dr. H. L. Ulrich, Minneapolis
4. Clinic on Neurology
 - (a) Nervous Disorders in Pernicious Anemia. Dr. A. S. Hamilton, Minneapolis
 - (b) Early Diagnosis of Tabes Dorsalis. Dr. J. C. McKinley, Minneapolis
 - (c) The Sequela of Encephalitis. Dr. E. M. Hammes, St. Paul
 - (d) Surgery in Spinal Cord Tumors. Dr. A. W. Adson, Rochester
 - (e) Clinic on Speech Defects. Dr. Smiley Blanton, Minneapolis

MEDICAL SECTION

TUESDAY, APRIL 28, 1925, 2 P. M.—

1. The Medical and Roentgenological Management of Hyperthyroidism. Dr. M. J. Kern, St. Cloud, Minn. Discussor: Dr. E. T. F. Richards, St. Paul.
2. Effect of Environment Upon the Upper Respiratory Tract and Clinical Significance. Dr. H. I. Lillie, Rochester. Discussors: Dr. J. A. Pratt, Minneapolis; Dr. Horace Newhart, Minneapolis.
3. Observations on the Chlorine Treatment of Acute Respiratory Infections. Dr. H. S. Diehl, University of Minnesota, Minneapolis. Discussors: Col. E. B. Vedder, Washington, D. C.; Dr. J. A. Myers, Minneapolis; Dr. E. D. Anderson, Minneapolis.
4. Discussion of the Care and Treatment of the Psychoneurotic. Dr. W. A. Jones, Minneapolis. Discussors: Dr. Arthur Sweeney, St. Paul; Dr. Frederick Moersch, Rochester.
5. Congenital Syphilis and Its Treatment. Dr. E. F. Robb, Minneapolis. Discussors: Dr. C. O. Kohlbry, Duluth; Dr. D. D. Turnacliffe, Minneapolis.
6. Phases of the Smallpox Epidemic, with Lantern Slide Demonstrations. Dr. S. E. Sweitzer, Minneapolis. Discussors: Dr. O. N. McDaniel, Minneapolis; Dr. H. E. Mickelson, Minneapolis.
7. Pathology and Diagnosis of Pulmonary Tuberculosis—Dr. Lewis Gregory Cole's (New York City) Moving Picture Film. Presented by Dr. Longstreet Taylor, St. Paul. No discussors.

WEDNESDAY, APRIL 29, 1925, 2 P. M.—

1. Public Health—A Challenge to the Medical Profession. Dr. O. E. Locken, Crookston. Discussors: Dr. C. H. Mayo, Rochester; Dr. O. W. Lindsay, Winona.
2. The Dick Test, Immunization and Treatment of Scarlet Fever. Dr. Woodard Colby, St. Paul. Discussors: Dr. E. S. Platou, Minneapolis; Dr. E. J. Huenekens, Minneapolis.
3. The Use of Novasurol as a Diuretic. Dr. Harry Oerting, St. Paul. Discussor: Dr. Norman Keith, Rochester.

4. Psychology of Compensation Neurosis. Dr. Arthur Sweeney, St. Paul. Discussors: Dr. A. S. Hamilton, Minneapolis; Dr. W. E. Hengstler, St. Paul.
5. Postoperative Pulmonary Complications. Dr. Paul G. Boman, Duluth. Discussors: Dr. H. Richardson, St. Paul; Dr. Norman Keith, Rochester.
6. Management of Toxemia Associated with Gastric Stasis, Obstructive and Non-obstructive. Dr. C. S. McVicar, Rochester. Discussors: Dr. D. C. Bal-four, Rochester; Dr. E. L. Tuohy, Duluth.
7. Causes of Death in the Fetus and Newborn; Based on 450 Necropsies. Dr. F. L. Adair, Minneapolis. Discussors: Dr. W. A. O'Brien, University of Minnesota, Minneapolis; Dr. Roger Kennedy, Rochester; Dr. J. C. Litzenberg, Minneapolis.

SURGICAL SECTION

TUESDAY, APRIL 28, 2 P. M.—

1. Embryology of Upper Urinary Tract: Anomalies with Report of Cases. Dr. F. E. B. Foley, St. Paul.
2. Ureteral Stone. Dr. John M. Culligan, Rochester.
3. Kidney Tuberculosis. Dr. Gilbert Thomas, Minneapolis.
4. New Antiseptics, Their Value. Dr. W. F. Braasch, Rochester. Discussion to be opened by Dr. Oscar Owre, Minneapolis, and Dr. Franklin R. Wright, Minneapolis.
5. The Grading of Cancer. Dr. A. C. Broders, Rochester.
6. Cancer of the Intestinal Tract. Dr. A. C. Strachauer, Minneapolis. Discussion to be opened by Dr. C. B. Lewis, St. Cloud, and Dr. Charles Bolsta, Ortonville.
7. Tumors of the Thymus. Dr. John A. Evert, St. Paul.

WEDNESDAY, APRIL 28, 2 P. M.—

1. The Streptococcus in Its Surgical Aspects. Dr. E. C. Rosenow, Rochester.
2. The Treatment of Acute Appendicitis. Dr. Theodor Bratrud, Warren. Discussion opened by Dr. O. W. Parker, Ely.
3. Perforated Gastric and Duodenal Ulcer. Dr. J. S. Holbrook, Mankato. Discussion opened by Dr. Roland Gilmore, Bemidji.
4. Production and Healing of Peptic Ulcer—An Experimental Study. Dr. F. C. Mann, Rochester.
5. The Surgery of the Spleen. Dr. Archa Wilcox, Minneapolis.
6. The Lowering of the Mortality Rate in Toxic Adenoma of the Thyroid. Dr. T. L. Chapman, Duluth. Discussion opened by Dr. Harper Workman, Tracy.
7. Clinical and Roentgenological Differentiation of Some Apparently Similar Bone Lesions. Dr. Wallace Cole, St. Paul.

REPORT OF PROGRAM

CLINIC WEEK DAY, APRIL 30, 1925

Anatomical Auditorium
University of Minnesota
8:30 A. M. AND 2 P. M.

GUSTAV SCHWYZER, M.D.

Goiter Clinic With Operated Cases and Demonstration Cases.

E. J. HUENEKENS, M.D.

The Maxillary Sinus as a Focus of Infection in Childhood; Presentation of x-rays and patients.

E. L. GARDNER, M.D.

Functional Diseases of the Colon.

W. R. MURRAY, M.D.

External Eye Diseases—Presentation of Clinical Cases and Lantern Demonstrations.

ARCHA WILCOX, M.D.

"The Acute Abdomen"—Diagnosis and Surgical Treatment Illustrated by Patients.

J. C. LITZENBERG, M.D.

Obstetrical and Gynecological Clinic.

F. C. RODDA, M.D.

A Case of Acrodynia.

J. P. SCHNEIDER, M.D.

"A Series of the More Unusual Gastro-Intestinal Lesions."

S. E. SWEITZER, M.D.

Presentation and Demonstration of Common Form of Skin Disease.

FRANK WRIGHT, M.D.

Prostatic Cases, Their Management and Treatment.

EMIL S. GEIST, M.D.

(a) Dislocation of the Carpal Semilunar Bones.

(b) Volkmann Contracture.

W. A. JONES, M.D.

Congenital Brain Defects—Demonstration Cases.

ARTHUR STRACHAUER, M.D.

Surgery of the Head.

J. FRANK CORBETT, M.D.

Neurological Surgery With Demonstrations.

R. E. FARR, M.D.

Some Phases of Plastic Surgery.

THE AMERICAN BOARD OF OTOLARYNGOLOGY

The American Board of Otolaryngology will hold its first examination during the meeting of the American Medical Association in Atlantic City, May 25th to 28th.

According to the rules of the Board, applicants are divided into three classes.

Class I. Those who have practiced Otolaryngology ten years or more.

Class II. Those who have practiced Otolaryngology five years and less than ten years.

Class III. Those who have practiced Otolaryngology less than five years.

The type of examination is different for each class.

The secretary, Dr. H. W. Loeb, announces that thus far over three hundred applications have been made.

LYMANHURST STAFF MEETING

The regular meeting of the medical staff of the Lymanhurst School for Tuberculous Children will be held in the Lymanhurst School, 1800 Chicago Avenue, Minneapolis, Tuesday evening, April 21, at 7 o'clock.

The following program will be given:

"Unsolved Problems in the Pathology and Bacteriology of Tuberculosis." Dr. H. E. Robertson, Mayo Clinic, Rochester, Minnesota.

Motion Picture Film Demonstrating Diagnosis, Retrogression, Progression, Etc., of Tuberculosis. This film was prepared by Dr. Cole of New York City and will be presented by Dr. H. Longstreet Taylor of St. Paul.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

RAMSEY COUNTY MEDICAL SOCIETY

The regular monthly meeting of the Ramsey County Medical Society was held in the Society rooms, St. Paul, February 23, 1925, the President, Dr. E. M. Hammes, in the chair.

Dr. F. C. Schuldt read a paper on "Tumors of Testis." Discussion by Dr. E. T. Bell, University of Minnesota, and Dr. Justus Ohage, Jr., and Dr. Margaret Warwick.

The second paper of the evening was read by Dr. F. E. B. Foley on "Embryology of Upper Urinary Tract, Anomalies." Discussion by Drs. Schuldt, Donohue, George Earl and Donald Bacon.

INTER-STATE CLINIC TOUR

The last call is being issued for the tour of the Inter-State Postgraduate Assembly clinic tour of American physicians to Canada, the British Isles and France.

The registration on March 17th was 375 physicians and a total of 625 including members of physicians' families. Forty-one states and a number of provinces of Canada are represented.

Two new one-cabin ships have been chartered, the *Ansonia* (Cunard line) and the *Doric* (White Star line).

The tour leaves Chicago, May 17th. Reservation fee of \$65.00 per person should be sent to Dr. William B. Peck, Managing Director, Freeport, Illinois.

OF GENERAL INTEREST

Dr. Arthur Sweeney, St. Paul, has returned from Florida and has resumed his practice.

Dr. K. D. Fairley of Melbourne, Australia, spent several weeks visiting the Mayo Clinic, Rochester.

Dr. and Mrs. F. Neher, St. Paul, are receiving congratulations on the birth of a son on February 27.

Dr. C. H. Mayo spoke before the students of the medical school of the University of Iowa on Saturday, February 21.

Dr. H. C. Otto of Frazee, Minn., spent the second week of February attending Dr. Granger's lectures at the university.

Dr. J. J. Conybeare of Guy's Hospital, London, a Rockefeller Foundation Fellow, is spending several weeks at the Mayo Clinic.

Dr. and Mrs. William Lerche of St. Paul, who have been spending some time in the West Indies, will return about the first of April.

Dr. W. E. Wray of Campbell, Minn., attended the special lecture given by Dr. Granger at the university the second week in February.

The annual banquet of the Phi Rho Sigma medical fraternity will take place Saturday, April 18, at the Nicollet Hotel, Minneapolis.

Dr. Gilbert J. Thomas, Minneapolis, was elected president of the Superior Golf Club at a meeting of the board of directors held in March.

Dr. New attended the meeting of the Middle Section of the American Laryngological, Rhinological, and Otological Society at Lafayette, Indiana.

St. Luke's Hospital, Duluth, held its monthly staff meeting on the evening of March 3. There were in attendance about fifty staff members and visitors.

Dr. H. I. Lillie attended the meeting of the Midwestern Section of the American Laryngological, Rhinological, and Otological Society, at Colorado Springs.

Dr. J. A. Freeborn, Dr. F. Naegeli, and Dr. T. S. Paulson, all of Fergus Falls, attended the lectures in physiotherapy given at the state university last month.

Dr. Earle Page of Melbourne, Australia, Secretary of the Treasury of the Commonwealth of Australia, visited the Mayo Clinic the early part of February.

Dr. W. C. MacCarty, Rochester, has been in the South speaking before sectional meetings of the American College of Surgeons and visiting various medical colleges.

Dr. C. H. Mayo and Dr. H. S. Plummer gave the Beaumont Foundation Lectures of the Wayne County Medical Society in Detroit, Michigan, the latter part of January.

Dr. Arthur C. Strachauer gave a talk on "Cancer of the Large Bowel" before the noon-day meeting of the Hennepin County Medical Society on Wednesday, January 7th.

Dr. and Mrs. W. J. Mayo, Dr. and Mrs. D. C. Balfour, and Dr. and Mrs. J. C. Masson, and Dr. and Mrs. M. S. Henderson spent several weeks during February in Florida.

Dr. A. C. Strachauer presented a paper on "Cancer of the Oral Cavity" before the Minnesota State Dental Association, which met in the Kenwood Armory, Minneapolis, on Feb. 10, 1925.

Dr. A. W. Adson spent the early part of February in the West speaking before the Sectional meetings of the American College of Surgeons at San Diego, El Paso, and Little Rock.

The Southern Minnesota Medical Association will hold its annual meeting at Owatonna, Monday, May 18, 1925, according to an announcement made by the secretary, Dr. H. T. McGuigan.

At the annual meeting of the staff of St. Barnabas Hospital, January 4, 1925, Dr. H. C. Stuhr was elected chairman, Dr. G. L. Doxey, vice chairman, and Dr. E. W. Bedford, secretary-treasurer.

Mr. and Mrs. Russel Brown are the proud parents of a baby boy born February 21, 1925. Russel Brown is a mem-

ber of Phi Rho Sigma and is attending the medical college at the University of Minnesota.

Drs. W. F. Braasch, A. B. Moore, A. U. Desjardins, and E. S. Judd attended the meeting of the Middle Section of the American Roentgen Ray Society held in Detroit, Michigan, from February 19 to 21.

Dr. E. C. Kendall received the Chandler Medal, given annually by Columbia University for outstanding contributions to science, on February 12, when he went to New York to deliver the Chandler Lecture.

Dr. E. V. McCollum, Professor of Biochemistry in the Johns Hopkins School of Hygiene and Public Health, was in Rochester on January 13, to give a Mayo Foundation lecture on "Our Knowledge of Vitamins."

Dr. Russell M. Wilder gave the annual address of the Minnesota Pathological Society at the Institute of Anatomy, University of Minnesota, February 17. The subject of his lecture was "Studies in the Metabolism of Diabetes."

Professor E. T. Bell, of the University of Minnesota Pathological Department, gave an instructive lecture and paper before the St. Louis County Medical Society on the evening of March 12, on the general subject, "Tumors."

Dr. Martin Nordland of Minneapolis left early in March for Bern, Switzerland, where he will study thyroid diseases at the Inselspital under the direction of Dr. F. De Quervain. Dr. Nordland will remain in Switzerland for five months.

Dr. Graham Lusk of New York spent February 20 and 21 in Rochester, when he came to give the fifth of a series of lectures on nutrition under the auspices of the Mayo Foundation. His subject was "Problems of Metabolism."

Dr. Amos Leuty, also Dr. E. J. Fitzgerald, of Morris, were attendants at a week's course of lectures on Physiotherapy, delivered by Dr. Frank Granger of Harvard University, at the University of Minnesota. A total attendance of 150 physicians was reported.

Professor August von Wassermann, the originator of the Wassermann blood test, died March 16, 1925, in Berlin at the age of fifty-nine. He was director of the Kaiser Wilhelm institute for experimental therapy and professor of internal medicine at the University of Berlin.

The regular monthly meeting of the staff of Bethesda Hospital was held on February 23, Dr. K. C. Wold presiding. An excellent program was provided by the committee in charge, which included a paper by Dr. Philemon Roy on "Ectopic Gestation." A spirited general discussion followed.

Dr. H. B. Sweetser presented a paper on "Splenectomy in Purpura Hemorrhagica With Report of a Case" before the Minnesota Pathological Society at its meeting held Tuesday, March 17. "Experimental Glomerulonephritis in Monkeys" was the subject presented by Drs. E. T. Bell and B. J. Clawson.

Announcement has been made of the engagement of Miss Margaret Wellner, daughter of Dr. and Mrs. George C. Wellner, of Minneapolis, to Dr. H. W. Kohl, now of Walter

Reed Hospital, Washington, D. C. Dr. Kohl is a member of Phi Rho Sigma and graduated from the University of Minnesota medical school in December.

The University of Michigan announces a six weeks' Summer Session in Public Health which will take place from June 22 to July 31, 1925. A variety of courses of value to those interested in public health matters will be offered. These courses include general hygiene and public health, school hygiene, child hygiene, principles of public health nursing, public health administration, etc.

Articles by members of the department of pharmacology which have appeared in various scientific publications during the last ten years have been reprinted by the University of Minnesota. A hundred copies of the bulletin, called "Contributions from the Department of Pharmacology," volume I, 1914-24, are being mailed to a selected list of doctors, medical schools, pharmacologists, and others interested.

Phi Rho Sigma medical fraternity has announced the initiation of the following men, which occurred February 7, 1925: Ernest Nethercott, Christian Rohrer, John B. Beuning, Lyder L. Laugeson, L. Ray Scherer, Robert Haskin, Edwin Anderson, Joe Moen, Charles Aling, John Decker and Harry Warner. The fraternity held their quarterly dance at the Leamington Hotel, February 27, in honor of the present initiates and alumni.

St. Mary's Hospital, Duluth, held its monthly staff meeting on the evening of March 5. The meeting was held in conjunction with the Duluth Dental Society, and nearly 100, in all, were in attendance. In addition to the usual staff proceedings, Professor George Monson of Minneapolis gave a lecture, with exhibition of slides, models and specimens, on the subject, "Occlusion of Teeth and Its Relation to Normal Mastication and Deglutition."

Twenty-three of the most eminent medical and surgical specialists in London have formed a clinic at which for a fixed rate of \$75 a patient may consult any or all of them. Lord Dawson of Penn, physician to the king and prince of Wales, Sir William Lister, Sir Henry Simpson, Sir John Thompson-Walker are among the members. They have acquired a huge house in Mayfair, in the Harley street district, and have their individual offices there.

"Chest Surgery" was the subject of an address given by Dr. Carl A. Hedblom, chief of the department of surgery of the University of Wisconsin medical school, at the meeting of the Lymanhurst School staff, March 24. Dr. Ruth Boynton presented a paper entitled "Types of Tuberculosis Causing Death in Minnesota Children." Dr. E. S. Platou had chosen for his subject, "Scarlet Fever Immunity; Results With the Use of Toxin and Present Status of This Question."

St. Cloud will have a new two hundred bed hospital in the immediate future, according to announcement made recently by Sisters of the Order of St. Benedict, St. Joseph. Plans for this hospital, to cost between four and five hundred thousand dollars, are to be drawn at once, and work started on construction immediately thereafter. The hospital will be located on a tract of twenty acres of land just

north of Hester park, purchased by the Order six years ago for this purpose.

Dr. J. S. Rodman, secretary of the National Board of Medical Examiners, has announced that three additional states, Michigan, Oklahoma and Wyoming, have notified the Board that henceforth they will accept its certificate as qualifying physicians to practice medicine in those states. This makes a total of 31 states (including Minnesota) which now recognize the Board's certificate granted to candidates passing its uniform qualifying examinations, in addition to the territory of Porto Rico, the Military Reservation of the Canal Zone, and England and Scotland.

By action of the Board of Regents of the University of Minnesota, Henry F. Nachtrieb, professor of animal biology and head of the department of animal biology, and Richard O. Beard, associate professor of physiology, have been made professors emeriti. Professor Nachtrieb graduated from the University of Minnesota in 1886, and was made head of the department of animal biology the following year. He was the original organizer of the General Alumni Association of the University of Minnesota, and was its president for a number of years. He is still active in the affairs of the association as a member of the board of directors. Dr. Beard is the only remaining member of the original medical faculty. Both appointments are to take effect at the beginning of the 1925-26 school year.

To those who have been watching and have been interested in the progress of the Statute of Limitations bill through the Legislature, we are pleased to announce that this bill was passed by the Senate on March 11 without a dissenting vote. It has been recommended by the Judiciary Committee of the House for passage by that body and in order to insure its coming up during the present session and not being lost in the shuffle of last minute legislation, the Legislative Committee has succeeded in having the bill placed on Special Orders.

This looks very favorable so far and it is hard to believe this is the same bill that was killed summarily four years ago. It simply shows that the profession must be stirred up so as to take an interest in legislation and also that someone of the profession must spend his entire time looking after legislative matters. This has been done this season through the efforts of Dr. H. M. Johnson, chairman of the Legislative Committee, and his associates.

Only Russia and India surpass the United States in the number of smallpox cases in 1923, according to recent report made by a committee investigating for the League of Nations. The report was recently received by E. P. Lyon, dean of the College of Medicine, University of Minnesota. It has been commonly supposed that the United States was one of the most sanitary countries, but according to a bulletin issued by the American Association for Medical Progress the nations which have been scourged by war and disease have been able to avoid severe cases of the smallpox better than has the United States. The bulletin published by the association urges the vaccination of all people residing in the United States.—*Minnesota Daily*, March 10, 1925.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

MULFORD, H. K.:

Tuberculin Intracutaneous (Human Type)-Mulford.

PARKE, DAVIS & Co.:

Mercurosal Ampules.

E. R. SQUIBB & SONS:

Squibb's Liquid Petrolatum with Agar.

Antimony Thioglycollamide.—The triamide of antimony thioglycollic acid. It contains not less than 30 per cent of antimony. Antimony thioglycollamide and antimony sodium thioglycollate have been tested on rats, rabbits and dogs inoculated with trypanosomiasis by Rowntree and Abel. These workers suggested the employment of these antimony compounds in the treatment of human trypanosomiasis and the larger animals. Randall has used both of these antimony compounds intravenously and intramuscularly in granuloma inquinae with marked success. In the doses employed they were less toxic than tartar emetic and the results were more favorable. From the available evidence the experimental use of these compounds in kala azar would seem to be justifiable. Hynson, Westcott & Dunning, Baltimore. (Jour. A. M. A., Feb. 7, 1925, p. 441.)

Cinchophen-B.P.C.—A brand of cinchophen-N.N.R. For a discussion of the actions, uses and dosage, see New and Non-official Remedies, 1924, p. 93. Benzol Products Co., Newark, N. J.

Hoyt's Protein Cereal.—Hoyt's special gluten flour (New and Non-official Remedies, 1924, p. 195) cooked and made into flakes. Pure Gluten Food Company, Brooklyn, N. Y.

Mercurettes-P. D. and Co.—Briquettes, each containing finely divided metallic mercury 3.25 gm. (50 grains) incorporated with theobroma (cacao butter) and perfumed. The actions and uses of mercurettes are the same as those of ointment of mercury U.S.P. It is claimed that in the treatment of syphilis and certain forms of parasitic skin diseases where ointment of mercury has been employed, the use of mercurettes permits a more accurate dosage and is more convenient and less disagreeable. Parke, Davis and Co., Detroit.

Tablets Iodo-Casein with Chocolate.—Each tablet contains iodo-casein (New and Non-official Remedies, 1924, p. 156) equivalent to 0.01 gm. iodine. H. K. Mulford Co., Philadelphia. (Jour. A. M. A., Feb. 28, 1925, p. 675.)

PROPAGANDA FOR REFORM

Barbital and Unessential Modifications.—The British Medical Journal discusses the multiplicity of barbituric acid hypnotics which English physicians are importuned to prescribe. In America a similar condition exists. The numerous barbital derivatives and mixtures of these with other drugs result from the fact that we have no satisfactory method of evaluating the hypnotics. Apparently the proprietary interests have taken advantage of this situation, so that the proponents of these barbital derivatives

claim various specific advantages for them. British physicians complain of the many market names for substances which have practically the same action, yet with no indication of their derivation from the original and best known drug, barbitol. In this country, the Council of Pharmacy and Chemistry provides information concerning the composition and actions of just such products. Until scientific investigators have devised a satisfactory evaluation of this class of hypnotics, it would be much more in keeping with scientific advancement were proprietary houses to refrain from putting out new derivatives, and physicians to limit their prescriptions to the two drugs, barbitol and phenobarbital—the only barbitol preparations which have been accepted for New and Non-official Remedies. The danger to the public of the use of barbitol hypnotics is of growing concern. Barbitol, itself, has been the cause of many accidental deaths, and its use is not free from addiction. In England, barbitol is included in the poison schedule and further restriction of its sale is now being considered there. (Jour. A. M. A., Feb. 7, 1925, p. 445.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

MEETING OF JAN. 14, 1925

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, January 14, 1925, at 8 P. M. The meeting was called to order by the President, Dr. Ritchie. There were 26 members present.

The minutes of the December meeting were read and approved.

There were no papers read at this meeting, but the following members reported cases:

DR. E. M. HAMMES (St. Paul) reported the following case:

Patient, boy, 15 years old. I saw him in consultation with Dr. Lepak, November 26, 1924. The family history is negative; he is the only child. He had the usual childhood diseases; pneumonia at 8; ruptured appendix, which was operated, at 11.

Following the appendectomy he became very nervous, irritable, and restless at night. About this time he developed polyuria and polydipsia. He drank as much as six quarts of water during the night and about the same during the day. His mother stated that he voids gallons of urine. A diagnosis of diabetes insipidus was made, and there were short periods of improvement, during which he would void about three quarts in 24 hours.

In June, 1924, he began to have frontal and bitemporal headaches, and these continued until September, 1924. Then he started school, he sat up late to study and his headaches became more pronounced. He complained of disturbed vision. At this time Dr. L. A. Nelson examined his eyes and found the fundi normal. The patient became more irritable and restless. He would worry constantly about his father's work and everything around the house, etc. On November 15, while out walking, he became dizzy, his feet began to drag, and he walked with a scissors-like

gait. He became rigid and unconscious. His mother, who was nearby, grabbed him so he did not fall. He soon regained consciousness and felt weak for a short while. From November 15 to November 26 he had eight similar attacks. Some of these attacks would begin by his repeating the figures 5,6,5,6 several times. Then his head would turn to the left, his eyes would close, and he would appear semi-conscious. This would subside within a few minutes. Since September, 1924, the father has noticed a marked development of pubic hairs and that the external genital organs are increasing in size. His downy mustache is becoming much heavier, and his voice deeper and coarser. Since this time the polyuria and polydipsia have become more pronounced. He had frequent vomiting spells. His thirst was excessive and painful. His eyesight failed so that he could not tell time by looking at an ordinary watch. He was unduly irritable, extremely restless, and would sleep one or two hours at night. His gait was somewhat staggering.

The neurological examination on November 26 showed that the right pupil was slightly larger than the left; his vision was poor, but response to light was normal and to accommodation sluggish. There was a general narrowing of the fields of vision. He had a marked Rhomberg to the left and backward and a tendency to fall similarly when he attempted to walk. His upper extremities were normal except for adiadokocinesis of the left hand. His lower extremities showed increased knee jerks and increased ankle jerks, a questionable Babinski on the right side. His thirst was so marked that in his hurry to drink he would spill water all over his mouth and face. His weight was 55 pounds. He had lost 21 pounds in three weeks. His spinal fluid was normal throughout except that the pressure was moderately increased. Two x-rays of the skull were negative. The sella was normal. He had quite a downy growth of hair on his face, especially his upper lip, more pronounced than the average boy of his age. His external genital organs were much larger than the average.

He was placed on one-grain doses of luminal twice a day and daily hypodermics of one-half c.c. of pituitrin. By December 17 he had gained 5 pounds in weight. His sleep was better and his nervous restlessness was subsiding. The medication was continued until January 5, when the patient complained that his breasts were enlarged and somewhat painful. His headache was returning. His sleep was poorer. His polydipsia and polyuria were more pronounced. He passed about six quarts in twenty-four hours. However, his weight gradually increased and by January 12 he weighed 72 pounds, a gain of 17 pounds.

Because of the moderately dilated right pupil, the marked polyuria and polydipsia, and the precocious sexual development, we are evidently dealing with a marked internal glandular disturbance. The picture as a whole is very suggestive of a lesion of the pineal gland, probably cystic in character, and causing some pressure in the region of the hypophysis. This would explain his polyuria and polydipsia and his improvement under pituitary extract.

DR. A. E. BENJAMIN (Minneapolis) reported two cases.
1. H. P., age 42 years, male, single, farmer. Three or

four hours after meals he is quite distressed with gas, but comfortable immediately after eating; noticeable at nights on waking. Three or four attacks of pain and vomiting during the year. Soreness near umbilicus.

Father living and well; mother died at 81 of old age. Brother living and well; two brothers died in infancy, and one of ruptured ulcer at 32 (intestinal ulcer just below stomach); three sisters living and well. One sister died of ruptured gastric ulcer at age of 49. Three or four days previous to death she visited a doctor, was operated and died within a few hours after operation.

The patient has had pneumonia, influenza, scarlatina, measles, whooping cough; as a child had peritonitis, sick four or five days, some pain and vomiting, and was out of his head.

Bowels regular, considerable distress several hours after eating; great deal of gas in stomach.

Physical examination shows some post-nasal catarrh. Sinuses and teeth healthy. Dilated and prolapsed stomach, somewhat lax abdominal muscles. Has pain upon pressure over appendix; appendiceal region very sore.

Hemoglobin, 90 per cent. Urinalysis negative. Evidence from x-ray examination (12/2/24) points to a chronic duodenal ulcer or a small diverticulum of the duodenum. The large retention indicates a partial obstruction at the pylorus.

Operative findings: Ulcer with indurated mass at pylorus 1.25 inches in diameter; anterior surface red and no adhesions except posterior surface stomach more fixed to gastro-colic omentum and one band extending to ulcer from base of gallbladder, which was normal. Appendix thickened and chronically diseased. Hard to control bleeding of gastro-enterostomy.

Operative technic: Right rectus incision. Posterior gastro-enterostomy. Pagenstecher for inside; chromic for outside; opening 3 inches long, angles and special areas supplemented by third row. Mesentery stitched to stomach around opening. Appendix removed, covering stump with mesentery of appendix. One Penrose drain; two skin, and three stay sutures; chromic for peritoneum, and posterior sheath of rectus turning it out. Chromic for fascia and skin.

Comment: This case is interesting on account of the family history. It demonstrates the advisability of not postponing the operative treatment as the last resort.

Case 2. Mrs. E. W., age 35 years, married, Scandinavian housewife, complains of dull aching pain through pelvic region and back; no soreness of abdomen, but is constipated.

Family history: No cancer or tuberculosis in others. Father and mother living and well; three sisters living and well. Two children living, one dead from ether pneumonia. Husband living and well.

Patient has had measles, chicken-pox and mumps. No severe complications. Seven years ago had acute appendicitis with drainage. One year ago in April one-third of each tube removed.

Bowels constipated; uses mineral oil and cathartics.

Menses began at 13 years. Regular every 28 days, moderate flow, no pain.

Physical examination shows slight visceroptosis in erect position. Tenderness over lower part of scar, uterine fundus and remnants of tubes. Both ovaries enlarged and prolapsed. Fundus uteri in normal position but some increase in size. Hemoglobin 75 per cent.

Findings at operation: Rectocele; loops of small intestines and omentum adherent to whole of abdominal scar area and beyond; also in pelvis to remnant of tubes. Ovaries somewhat cystic; previous fixation of fundus.

Operation and technic: Repaired perineum. Adhesions carefully separated; raw surface covered. Remnants of both tubes dissected, out of horn of uterus; ovaries resected; round ligaments fastened over fundus, sterile vaseline on raw surfaces; three Penrose drains.

Comment: The points of interest about this case are the adhesions around the imperfectly removed tubes at former operation. If the tube is sufficiently diseased and requires its removal there is less likely to be any trouble following its removal if a portion of the tube is removed, and purse-stringing this area and covering it with the round ligaments for support, and to prevent subsequent adhesions. The second interesting point in connection with this case is the presence of adhesions in and around the peritoneal wound from the former operation.

We must endeavor to prevent these adhesions as much as possible and one definite way of obviating the condition found in this case is by turning the peritoneum outward in closing the abdomen, thereby maintaining a smooth surface within the abdomen and no raw surface or chance for the omentum to escape between the stitch line. Plain catgut may absorb too readily in some of these cases, therefore I have used a No. 0 chromic catgut double for this purpose, and in a thinned-out condition of the peritoneum the fascia above may be caught with the suture for additional support, and thereby preventing rents in the peritoneum.

DR. ARNOLD SCHWYZER reported the case of a man with arthritis of the hip on which arthroplasty had been performed.

The meeting adjourned.

JOHN E. HYNES, M.D.,
Secretary.

MEETING OF FEB. 11, 1925

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 11, 1925, at 8 o'clock. The meeting was called to order by the President, Dr. Ritchie. There were 49 members and 2 visitors present.

The minutes of the January meeting were read and approved.

DR. F. R. WRIGHT (Minneapolis) gave the following case report:

About a week ago a patient came in from South Dakota. At this time he had in the right groin what at first glance appeared to be suppurating inguinal glands. On going into the history, I found that six years before this he had had an attack of pain in the side and back and was in

bed for a month. Finally an abscess formed and was drained with stab puncture near the border of the erector spinæ muscle, and this drained for about six months. Then he went to Rochester and had a complete examination, with the result that they found nothing wrong. Three years from that time he went through a similar attack and was again drained in the hack. A year ago a lump appeared just below the fold of his right groin which existed for about sixty days and then opened. At the time he came to me he had two fistulæ, one exactly in the fold of the groin and one an inch and a half below it. In exploring this with an urethral bougie I found a fistula into which a bougie would go without resistance about 8 or 9 inches. An x-ray plate was made with a lead-filled bougie in the fistula which showed leading directly into the cecum.

A diagnosis was made of chronic suppurating appendix. The patient was operated the next day and the chronic appendix removed. The appendix was found retrocecal with the end attached to the fistula leading to the groin. The man made an uninterrupted recovery.

At operation, also, we found two or three spoonfuls of gelatine-like material accumulated around this inflamed appendix, evidently the inflammatory exudate, which was thickened as heavy as light gelatine or like the thick contents of an ovarian cyst.

I recall that thirty years ago, when I was an intern at St. Barnabas Hospital, Dr. J. E. Moore operated a case of chronic appendicitis where the abdomen contained a large quantity of this same gelatine-like material.

DR. R. E. FARR (Minneapolis) reported the following case:

I wish to report the case of an unmarried woman, age 36, who had an abdominal tumor for some time. A few days before she came to me, she had begun to have rather severe pain in the lower abdomen. Her temperature was normal, her pain was not so severe, and the tumor was palpable and movable. Upon opening the abdomen, it was found that she had a tumor of the left ovary which was like an hour-glass in shape, one end of the tumor being solid, the other end cystic. Each half of the tumor was about the size of an ordinary apple. The tumor was found to be twisted around its pedicle 360 degrees. This carried the meso-salpinx around the pedicle of the tumor so that the Fallopian tube completely encircled it.

The case is reported because of the rarity of ovarian fibroids (which this proved to be) and on account of the torsion of the pedicle. The patient made an uninterrupted recovery.

DR. W. A. COVENTRY (Duluth) then read his inaugural thesis, entitled "Some Observations of the Sturmdorf Operation on the Cervix Uteri."

DISCUSSION

DR. LITZENBERG: Sturmdorf brought out his operation really in competition to the Schröder amputation technic. It is a decided improvement on the Schröder operation in certain types of cases. However, I think the usually advocated indications for the operation are too broad. We find

at the University Hospital that we still get better results from the Schröder technic in deeply lacerated cervixes. However, as Dr. Coventry says, we find that hypertrophy of the cervix with numerous Nabothian cysts is the typical cervix for the Sturmdorf operation. Sturmdorf claims that more tissue can be removed than by the Schröder. I doubt that; but that it can be better removed in certain cases, I have no doubt.

In most of the cases we use a glass stem pessary to avoid complications which Dr. Coventry mentioned. We do not sew it in; we do not believe in leaving it in for a long time. We simply insert it, letting it come out in a short time. In this way there is no danger of stenosis of the cervix.

I still think that both operations have their place; the Schröder being preferred when the cervix is deeply lacerated, and the Sturmdorf in all other cases.

DR. WRIGHT: I want to say one word in regard to silkworm gut used in the cervix. Where it is not satisfactory, or is lost, that is due to technical error on the part of the surgeon or assistant; if the ends are pulled out and cut two inches long they are easily found and you will not lose them.

DR. BENJAMIN: I was pleased, indeed, to hear this paper. Dr. Coventry has brought out several valuable points. A number of years ago when Schröder brought out his operation, we were using silkworm gut, and once in a while we lost the suture. I devised an instrument to obviate this possibility with which we could always get the suture. This was a scissors with a clamp on the side of it, and a hook on the end of it. With this instrument we could hook up the suture, cut and clamp the suture, and pull it out at the same time.

The instrument was an expensive one, costing about \$20, so that when catgut came into vogue, we discarded the instrument and used chronic gut instead.

There are a few things about the technic that I wish to mention. Personally, I use a combined Schröder and Sturmdorf operation. Very often we find a great deal of scar tissue extending up into the canal. Many of these patients will have dysmenorrhea who never experienced it before having children. If we take out too little scar tissue, dysmenorrhea will still be present. It has been my custom to extend the incision in these cases up on the side of the cervix and remove the scar tissue to the internal os. In this way we get a soft cervix that yields. In these cases, I place a soft rubber tube in the cervix that prevents stenosis. We find it better than the stem pessary. The results are very satisfactory.

When the cervix is particularly diseased or infected, we treat these cases before operation as Dr. Coventry does.

DR. ROTHROCK: I have had no experience with this operation. I still use the Schröder, with very satisfactory results.

DR. E. L. TUOHY (Duluth) read a paper entitled "The Twilight Zone of Pathology and Clinical Medicine."

DISCUSSION

DR. A. SCHWYZER: It is rather difficult to discuss this subject in detail as there are so many individual items, but

the point Dr. Tuohy apparently wanted to make is, that without communicating or working with the clinical man, the pathologist is liable to go astray; but still more so, the clinical man will get into off-roads if he does not constantly consult the pathologist. It is even better if he is something of a pathologist himself and if he has an exact understanding of the anatomical (and physiological) presentation of the case and the particular organ under question. We clinical men must try to keep in touch with the pathologist, and not only that, but we must try to do as much pathology as we possibly can ourselves.

The time spent at the autopsy table and behind the microscope will keep the medical student from falling behind later and will help him keep step in the forward march of our science.

The doctor told us some things about goiter. I must confess that I do not agree with him there. We are not so much at sea about this subject as he puts it. In examining the goiter slides of our operative cases, I do not allow the pathologist to tell me which case it is. I always try to make out from the microscopic picture which one of three or four cases this may be. In the great majority of cases you have a pretty good idea of how toxic the case was when you examine the slides, if you do not confine yourself to one section. On the average we can pretty well say whether we have a very toxic goiter or a moderately toxic one, or whether we have an indolent form.

The first picture which Dr. Tuohy showed was a toxic goiter with large colloid follicles and only small scattered areas of nests of increased activity. In Switzerland, where we have so many large goiters, one frequently sees a very large goiter which later on becomes toxic. The toxic areas may be hidden in the bulk of the goiter and you may not detect them if you have not sections of different portions. The impression received from Dr. Tuohy's paper was that we still have a great incongruence between the clinical and the anatomical picture in the goiters. After so much splendid work has been done on goiter I do not like to feel that we are still so very much at sea.

Of late years the clinical men have done much in the field of pathology themselves. Let me just mention one example in relation to Dr. Tuohy's case of small abscesses in the liver with cholecystitis. Gundermann, in Poppert's clinic in Giesen, Germany, published over 200 cases of bacteriologically studied cholecystitis. Far away from the gallbladder he took small slices of liver tissue (similar to Graham's work) and in three-fourths of the cases he found bacteria in them and saw the small bile channels surrounded by infiltration. So that, in an outspoken cholecystitis, we have to figure with a cholangitis and a cholangiolitis. Thus Dr. Tuohy's case is not so much of a surprise any more.

Of course, there are a good many cases, like brain cases, where the clinical picture may be so much more outspoken and where the pathological findings are so small. It is often unfair to demand from the pathologist a definite finding at the present state of our knowledge.

I would like to mention an instance where the clinical findings widely differed from the report of the pathologist and which also shows how we have to work together. Many years ago, when I was still an assistant, a case was brought into our hospital and I was supposed to examine her. She

came for profuse bleeding and I curetted her. I told the Professor that we had a carcinoma of the corpus uteri. Specimens were sent over to the pathological laboratory and the laboratory sent back a report which amazed me—that the case was benign. I insisted that it was carcinoma just the same. The Professor looked at me as though he thought I was a young assistant who had too much to say. I told him, "If you put the curette into the uterus you will agree with me that it is carcinoma." He scooped out some whitish chunks. It was one of those cases of carcinoma, also called adenoma destruens.

The pathologist had not known his section went so deep into the tissues. It all goes to show that sane clinical work and pathology can not be separated, and the more a student uses the microscope and learns pathology, the broader is the foundation upon which he can build in his clinical work; and without it, the structure will remain shaky.

DR. GILFILLAN: This is one of the most interesting and instructive papers that I have heard for a long time and it is too bad that we do not have more along this line. I think probably the difficulty is too much specialism. It reminds me of the young man who got to be very narrow in his specialty and Dr. Tuohy advised him to take only one side of the nose and specialize on that. That is what we are all doing. Pathology is not such a little thing that it ought to be done only on dead bodies or on excised tissue. Pathology is physiology as well as anatomy. It is a study of tissues in the living as well as in the dead, but we split it in two. For instance, the pathologist reports that a patient died of fibroid heart. The question is, "How sick would that make him?" The day before, the patient had swallowed 7 grains of morphin and the doctor thought that was what killed him, but the pathologist did not know that. Many things have no anatomic pathology so far as we know. Epilepsy and migraine, for instance, are pathology quite definitely. The person who has them thinks so; but still in the deadhouse they do not make much of an impression.

Dr. Tuohy's idea is a correct one; if we have two people, one to do the clinical cases and one to do the dead, pathology is by no means complete. We are splitting it in two and not getting the halves together at all.

The clinician looks at the pathologist a good deal as he does at the Diety; that his judgments in all things are infallible, and forgets that the pathologists are human. A good pathologist tells us less than a poor one does. Some go so far even as to say they will not diagnose sarcoma from the microscopic slide.

So with many of these sections, and especially perhaps on the lymphatic things, we are way up in the air. We clinicians cannot get very far because the pathologist has not got very far. When we see a case under the microscope we can't tell about the clinical course. Some things must be diagnosed on a clinical basis, on the basis of symptoms without any great respect for what they look like under the microscope.

I recall one writer who spoke of the difference between broncho and lobar pneumonia. He said it was not the province of internal medicine to set up a classification of disease which could only be proven post-mortem; that we must make one which agrees with the clinical symptoms. We must make the diagnosis when the patient is alive.

DR. TUOHY (closing): I have not much to add except that I want to thank the gentlemen for their discussions. I feel amply repaid for the study by these discussions. I apologize, however, for keeping you so long.

The features I have been discussing most notably—these gland situations, pernicious anemia, leukemia, and Hodgkin's disease—the *course of the disease makes the diagnosis*, and obviously we can't entirely envision the whole complex by any clinical or anatomical *estimate made at any one period*, particularly before the full picture is arrived at.

As far as Dr. Schwyzer's discussion is concerned, I may say it is something on the order of the famous French obstetrician who went to Germany. When he came back he was asked, "What is the most remarkable thing you heard of over in Germany?" "I heard Prof. 'so-and-so' say that he is able with an instrument he has devised to hear the fetus cry." The obstetrician was asked, "But do you believe that?" He replied, "Coming from such a distinguished authority, I do; if I had heard it myself I would not have believed it."

The meeting adjourned.

JOHN E. HYNES, M.D.,
Secretary.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

PREGNANCY WITH COMPLICATIONS: PLACENTA PREVIA; HYDATIFORM MOLE— A CASE REPORT

DANIEL H. BESSESEN, M.D.
Minneapolis, Minn.

This patient, aged 24, a primipara, when seen first on July 12, 1923, gave a history of menstruating last in April, but with a slight showing with vomiting on June 2 and again on June 16. These bleeding spells had been attended with slightly crampy pains in the abdomen. Otherwise the history was entirely negative and she showed on examination evidence of a 3.5 months' pregnancy with good health. The progress of gestation was uneventful until she was admitted to the hospital on the 8th of October, with bleeding on slight effort. The patient was kept to her bed with morphin and atropin and after a week was dismissed again from the hospital. On November 3 she was once more removed to the hospital and the vagina packed. The diagnosis of placenta previa was made at this time and on the following day a Barnes bag was inserted and filled to capacity. The placenta was delivered and after this a large multicystic hydatiform mole with a well developed cord. All the pieces were expressed, an intrauterine douche of

potassium permanganate 1-6000 given and the small tear in the uterus repaired with chromic gut. Recovery was entirely normal and the patient left the hospital on the 14th day post delivery. Placenta previa is almost always indicated by hemorrhage from the vagina in the latter months of pregnancy. These patients may feel no pain or other untoward sensation from the heavy bleeding resulting from the misplacement of the placenta and death is known to occur during sleep from this cause without arousing the victim. The packing of the vagina or the insertion of a bag into the uterus are the surest procedures to check the hemorrhage. In cases where it is possible to carry pregnancy closer to term, the insertion of the bag may be left to a later date.

Hydatiform mole is usually distinguished by the escape from the vagina of the small grape-like vesicles characteristic of the condition and also by the increase in the size of the uterus to larger than is normal for the corresponding period of gestation. Neither of these diagnostic points were present in this case. The placental insertion over the exit of the uterus prevented the escape of the vesicles, and the uterus was the size of normal pregnancy throughout gestation. The mother stated that she had distinctly felt life at the usual time, and though no fetal heart sounds were heard and no definite fetal form was palpated, the diagnosis of pregnancy was not controverted until the time of delivery.

These hydatiform moles become malignant chorio-epitheliomata in from 25 to 33 per cent, according to various writers, and this change may occur up to 13 years following delivery.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:
F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

TUBERCULOUS ENTERITIS: Gerald B. Webb, M.D., and G. Burton Gilbert, M.D. (National Tuberculosis Association, Transactions, 1924). Tuberculous enteritis frequently occurs even in relatively early pulmonary cases. This complication can creep upon the scene in a most insidious manner. Physicians who wait for the appearance

of such classical symptoms as persistent diarrhea, abdominal pain, tenderness, rigidity or local thickening before making a diagnosis of tuberculosis of the intestinal tract will see only late cases with a relatively bad prognosis. The writers have learned to suspect a beginning tuberculous enteritis whenever patients complain of slight persistent nausea, anorexia, a feeling of discomfort after eating, undue nervousness, constipation and gaseous indigestion.

The x-ray has been of very great assistance in diagnosing early cases. Both a test meal and an enema should be given, following the technique devised by Brown and Sampson.

Time and experience have developed no more important remedy than rest. Granted, however, that we cannot produce any absolute functional rest for the diseased intestine, we can at least do the next best thing by putting the patient at rest in bed and reducing the work of the intestines to a minimum. Exercise not only increases the amount of nourishment required to keep the body in equilibrium but also stimulates peristalsis.

A patient at rest often can gain weight on a relatively low caloric intake. During rest all food given can be assimilated more easily. The one food requiring the least expenditure of digestive energy is milk. In short, milk in small doses taken often, say three or four ounces every waking hour, is the ideal diet for the ulcerative cases. Not all patients can take milk, but many can who think and say they cannot. This is true when they are properly encouraged, especially if the milk is modified by the addition of citrate, or lime water, or slightly flavored to suit the individual taste, or started with teaspoonful doses. If the patient is unable to gain weight, we give an ounce of cream with three ounces of milk; and, often, three or four ounces of equal portions of milk and cream are very efficacious. This addition of cream is also of value where there is a tendency to constipation. In obstinately constipated cases it may be necessary to give a little mineral oil. Many patients after a short time are allowed three or four small meals daily to take the place of three or four of the hourly feedings. The meals should not exceed six ounces. Not infrequently it is wise before starting this regime to empty thoroughly the intestinal tract by giving a minimal dose of calomel followed by a small dose of castor oil. When diarrhea is present no calomel should be given but the castor oil need not be omitted. A complete fast of a day or two, where the patients are in good general condition, is of decided value. In the rare cases where milk actually disagrees one may give other bland foods, especially proteins, in small doses at frequent intervals.

In general little medication is necessary but occasionally calcium and bismuth powders are very soothing. Applications of moist heat to the abdomen are apparently of some value in painful cases. Opium is reserved for those cases in which all other measures fail. Phototherapy is worthy of an extended trial in all cases, unless it be those with high fever and much prostration.

ARTHUR T. LAIRD, M.D.

ABSTRACT—THE CONTRALATERAL LUNG IN PULMONARY TUBERCULOSIS TREATED BY ARTIFICIAL PNEUMOTHORAX: R. W. Matson, R. C. Matson and M. Bisailon (*American Review of Tuberculosis*, 1925, x, 562). End results of pneumothorax are associated with the behavior of the opposite lung and deductions as to prognosis are based on the following classifications:

1. Essentially negative. It is often difficult, if not impossible, to demonstrate hidden foci in the contralateral lung.

2. The peribronchial type of tuberculosis by itself does not require great consideration so long as it remains confined to the peribronchial structures, but these are not always benign and there is a tendency to invasion of the lung parenchyma.

3. Disseminated bronchogenic caseous extensions occur as a result of the aspiration of bacilli-laden sputum into the contralateral lung, usually taking place in the dependent portion or the pre-hilar region.

- 4 and 5. Active and quiescent fibro-caseous infiltrations usually occur in the upper half of the lung and are recognized by the usual physical diagnostic signs.

Not infrequently excellent results leading to complete recovery can be obtained even in the presence of extensive disease in the opposite lung. These results depend on the character of the collapse, flexibility of the mediastinum and type of opposite lung lesion. The diseased lung varies greatly to the reaction of the collapse of the other lung. Fibro-caseous lesions in the apex are more favorable than lesions around the root of the lung.

Fluoroscopic examination before each inflation should be practised. During the early stages it is imperative to resort to the fluoroscope more frequently in order to determine the proper interval for inflation. One should not depend solely upon manometric pressure reading and physical findings to determine the character of the collapse.

Febrile reaction following inflation in the presence of a satisfactory collapse suggests activity in the opposite lung.

Of 480 cases hemoptysis was present previous to pneumothorax treatment in 82, but after treatment occurred in only 10 cases. Progression of the disease in the opposite lung brings up the question of re-expansion of the collapsed lung with collapse of the contralateral lung, but prognosis in cases so severe as to demand a bilateral pneumothorax is not good although the treatment will often add to the comfort and prolongation of life.

The end results in pneumothorax treatment depend less on the contralateral lung than on the character of the collapse and type of the disease in the more involved lung. The contralateral lung when diseased should always be suspected when unfavorable symptoms arise. In this series, in the presence of satisfactory collapse of the more diseased lung, results were much better with any type of contralateral lung lesion than those of the "no free pleural space" cases, with an essentially negative contralateral lung.

N. BLAKIE, M.D.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

RUPTURE OF THE DIAPHRAGM: Amos O. Koontz, M.D. (*Annals of Surgery*, lxxx, 1924, 898-907). The literature of diaphragmatic rupture is rather carefully considered in this article. Diaphragmatic hernias are of the false type in ninety per cent of the cases, only ten per cent having a sac. Hernias of the diaphragm are either congenital or traumatic in origin. Ninety-two per cent occur on the left side and the reasons offered for this are as follows: 1. The liver acts as a buffer on the right side. 2. Stabs and shots are more frequently met with on the left side. 3. Embryologically, the posterior portion of the left side of the diaphragm is the last portion to become closed.

The majority of congenital cases are not diagnosed unless by accident or at autopsy. On the other hand, traumatic cases are far less difficult to discover. The author reports a case of traumatic diaphragmatic hernia in detail, giving the post-mortem findings. Careful history, x-ray, and, if necessary, exploratory puncture of the chest, aid materially in diagnosing this uncommon condition. Surgery is advocated where symptoms of obstruction or rupture of the diaphragm are in evidence. Of two approaches the author believes the thoracic route more advantageous than the abdominal.

JACKSON K. HOLLOWAY, M.D.

JACK-KNIFE POSITION AFTER HERNIA OPERATIONS: Leigh F. Watson (*Annals of Surgery*, Aug., 1924, lxxx, pp. 239-241). The posture of the patient after an operation for hernia is usually neglected. If surgeons realized that they could reduce their recurrences materially, besides adding to the comfort of their patients, the jack-knife position would become a matter of routine for inguinal, femoral, umbilical and ventral hernias which present difficulties in closing the fascial layers.

In inguinal hernia operations the best exposure is obtained by keeping the thigh extended until the deep sutures are ready to be tied, when it should be elevated, adducted and rotated inward. This reduces the distance between Poupart's ligament, the internal oblique and conjoined tendon, from 25 to 50 per cent, depending on the size of the opening, the variety of hernia, and the development of the muscles. After the patient is returned to bed his knees and shoulders should be elevated 25 to 45 degrees by means of pillows and a back rest. This position takes the strain off of the stitches during the process of repair, permits a broad, firm union of fascial flaps, and reduces the percentage of recurrences. The jack-knife posture should be maintained as long as the patient stays in bed.

THE TREATMENT OF BRAIN ABSCESS BY UN-ROOFING AND TEMPORARY HERNIATION OF ABSCESS CAVITY WITH THE AVOIDANCE OF USUAL DRAINAGE METHODS: Joseph E. J. King, M.S., M.D., New York (S. C. O., Nov., 1924). King briefly reviews the methods heretofore used in the treatment of brain abscess which attempt three basic procedures:

1. The drainage of the abscess cavity;
2. Prevention of extension of meningeal infection;
3. Prevention of hernia cerebri.

In cases so treated there is always trouble caused by failure or dislodgment of drains. Secondary abscesses are of common occurrence and are difficult to drain, frequently causing death by rupture into the ventricle.

The author describes several cases where herniation of the brain through the craniotomy opening occurred. This causes the abscess cavity to become very shallow and eventually to become merely a flattened, cup-shaped area which quickly granulates over and recedes into the skull.

Recently, King has carried out his operative procedures with the intention of starting this sequence of events and finds his results to be far superior to those obtained in cases where herniation is prevented.

The operation is performed by making a trephine opening over the abscess, which is then definitely located by aspiration with a needle and syringe. The opening in the skull is then enlarged by rongeur forceps in whatever direction is necessary to completely unroof the cavity. The dura is opened by a stellate incision to create six pointed flaps which are pulled back around the bony margin and sutured to the scalp flaps. Small pieces of iodoform gauze are then lightly packed between the dura and cerebral cortex to prevent extension of infection; if adhesions exist, so much the better. The abscess is then opened and the overhanging cortical tissue excised, leaving a large opening into the cavity, which is irrigated with Dakin's solution and wiped out with cotton pledgets. If the abscess has a capsule it is not disturbed, as it tends to prevent too marked herniation of the brain.

By twenty-four hours after the operation the cavity will have become much more shallow and may have reached the level of the inner table of the skull. This protrusion increases daily until about the sixth post-operative day, when there is a large mushroom shaped mass outside the skull and the abscess cavity has become completely everted. This mass must not be cut away but must at all times be carefully protected from pressure and trauma. Lumbar puncture may be used to relieve pressure which would otherwise cause excessive size of the hernia. After three or four weeks the surface of the hernia will become covered with healthy red granulations and the size of the mass will become less day by day. The epithelium of the skin will also commence to creep over the mass. At this stage of affairs the skin margins may be pulled together by adhesive straps which exert slight pressure on the hernia. For the mass to entirely recede within the skull, and for epithelium to cover the area, will require two and one-half to three months.

DONALD K. BACON, M.D.

ACUTE PANCREATITIS: Sir Berkeley Moynihan (Annals of Surgery, vol. lxxxi, January, 1925, No. 1, pp. 132-142). There are three types of acute pancreatitis—hemorrhagic, gangrenous, and suppurative—varying only in degree.

Diagnosis should be easy if one only thinks of it. The symptoms are pain after a big meal, intense in the epigastrium and often in the back and both loins, profound collapse, and rapidly rising pulse with a blood pressure fall. The patient is pale, the limbs and face are cold, and death seems imminent. Vomiting, retching, hiccough are frequently present. "The face is livid, and patches of a slate-blue color may be distributed irregularly over the surface of the abdomen or even the limbs. This cyanosis is never found in other forms of acute abdominal catastrophe, so far as I know. It is not always present in acute pancreatitis, but if it is found, it is, I believe, an undeniable evidence of acute pancreatic disease." The abdomen is rigid but not to the extent seen in perforation of a viscus. The rigidity is mostly above the umbilicus, as is the tenderness. "The essential quality of the disease is autodigestion of the pancreas and that can rapidly occur only through an invasion of the duct."

Operation in these cases should be the treatment of choice, even though in rare instances a case has recovered spontaneously.

The operative treatment consists in drainage of the pancreas, which is sometimes reached above the stomach, through the gastrohepatic omentum, sometimes below the greater curvature through the gastrocolic omentum, and occasionally through the transverse mesocolon after the omentum has been turned upward. Great care should be exercised in aspirating and walling off any free fluid about the pancreas because it is very toxic. The gland itself need never be incised, but a finger can be insinuated into it to allow free drainage. Drainage is usually through the abdominal wall anteriorly, but in some cases, posterior drainage is established. The main aim is to have the drainage free. A coexisting gall-bladder involvement should be either left alone or handled in the most conservative way, depending upon the general condition of the patient.

WILLIAM P. HERBST, M.D.

CONGENITAL ABSENCE OF THE UTERUS: L. R. Wharton, M. D. (Surgery, Gynecology and Obstetrics, Jan., 1925). Doctor Wharton describes a specimen and points out the necessity of investigating the urinary tract in cases of mal-formed genital tract. This is important, as deformity in one is often associated with deformity in the other.

J. C. POTTER, M.D.

THE PLACE OF ELECTIVE VEIN LIGATION IN BLOOD VESSEL SURGERY: R. W. McMaly, M.D. (Surgery, Gynecology and Obstetrics, January, 1925). It is pointed out in this article that in sudden occlusion of the main artery simultaneous occlusion of the vein is indicated.

J. C. POTTER, M.D.

UNRECOGNIZED HEMORRHAGE WITHIN THE UPPER LEG RESULTING FATALLY: Charles L. Larkin, M.D., Waterbury, Conn. (S. G. O., Nov., 1924). The author calls attention to a definite traumatic condition, *i. e.*, hemorrhage within the upper leg which may go unrecognized and result fatally.

This is in contradistinction to the traumatic injuries to the upper leg which go on to the formation of hematomata.

This article shows that either oozing or a swift outpouring of blood after injury may go far beyond hematoma formation and, following the muscle sheaths and fascial planes, result in death.

Four cases are reported: one a stab wound of the groin; one a muscle tear of the sartorius and adductor muscles, and lastly, two fractures of the femur with muscle laceration.

In each instance, the original injury was followed by shock and collapse, the severity of which seemed entirely out of proportion to the original injury. Additional findings which might indicate the actual condition were first an enlargement of the thigh on the affected side which might cause an increase of two to three inches in the circumference. In several of the cases a bluish discoloration could be seen in Scarpa's triangle and a fluid wave could be demonstrated by percussion and palpation.

On dissection of the upper leg at necropsy, large amounts of blood were found in the muscle sheaths and along fascial planes; in several of the cases as much as two liters was present.

The author believes that this complication is sometimes present but unrecognized in fracture of the femur and that it may be responsible for the severe shock seen in some cases.

DONALD K. BACON, M.D.

THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS BY THORACOPLASTIC COLLAPSE: Aduan V. S. Lambert and James Alexander Miller (American Review of Tuberculosis, 1924, x, 9). The authors of this article report the results of their experience in the treatment of 20 cases during the past two and a half years by the Sauerbruch operation. Three died at operation, three more died later, 14 were cured or greatly improved. They believe that the present mortality of approximately 25 per cent may be reduced by more skillful selection of cases and improvement in technique and that approximately 50 per cent of cases can even at the present time be returned to a satisfactory degree of health. They favor the two stage operation for practically all cases. Prolonged after-treatment and close co-operation between the physician and the surgeon is necessary. The physician should be thoroughly familiar with the modern treatment of tuberculosis and experienced in it. The problem of surgical treatment is very closely associated with and bound up with the problem of treatment with artificial pneumothorax. In general suitable cases should have predominantly unilateral lesions. Lesions of the central and lower portions of the opposite lung usually preclude operation.

A. T. LAIRD, M.D.

EARLY RECOGNITION OF GASTRIC ULCER: Vaughan and Brams (Surgery, Gynecology and Obstetrics, Nov., 1924). The author reports a series of fifteen proven cases of acute perforation of gastric and duodenal ulcer in which x-ray examinations have been made before operation to determine the presence of gas in the peritoneal cavity. In all instances the x-ray was taken as early as possible after admission, in some as early as two or three hours after perforation occurred, and the x-ray evidence was checked up in all the cases by immediate operation.

The presence of free air in the peritoneal cavity is demonstrated by observing a clear, distinctly bright zone which shifts on change of posture of the patient. The outline of the gas bubble will be determined by its location and the nature of the structures which limit it. The most typical picture is seen when the patient is in the upright position, the narrow sickle shaped zone of air situated most frequently just under the right cupola of the diaphragm being the most characteristic sign. The gas bubble will seldom be confused with other things because of its sickle shape and the fact that it is very bright and distinct with no mottling of its body, and the boundaries are usually regular and constant in configuration. It is not essential to have the patient in the upright position, as a sufficiently characteristic picture may be obtained by placing the patient on his left side and observing the air bubble between the external abdominal wall and lateral surface of the liver. The entire procedure may be performed with the fluoroscopic screen, no preliminary preparation being necessary.

Thirteen of the fifteen cases reported by the author showed the presence of free air in the peritoneal cavity. This sign used in combination with other signs and symptoms is a valuable addition to the clinical syndrome produced by acute perforation of gastric or duodenal ulcer because it makes possible an early and definite diagnosis without danger or discomfort to the patient.

J. W. STINSON, M.D.

POSTOPERATIVE LEUKOCYTOSIS: Dr. Witter (Surgery, Gynecology and Obstetrics, January, 1925). There is a postoperative leukocytosis following operation which appears before the febrile reaction. In a general way the leukocyte and temperature curves run parallel. The leukocyte curve reaches its height by the fourth hour and is normal by the fifth day. It is mainly a polymorphonuclear increase.

J. C. POTTER, M.D.

THE TREATMENT OF ABORTION: H. K. Tuttle, M.D. (Surgery, Gynecology and Obstetrics, January, 1925). In cases of retained membranes, sepsis, or boggy bleeding uteri, prompt emptying of the uterus and packing are the general principles best followed. Attention is called to the control of the hemorrhage by packing, especially in those cases which pass clots occasionally but otherwise show little external bleeding. The usual complete abortion requires little beyond rest, pituitrin, and ergot.

J. C. POTTER, M.D.

THE EFFECT OF SURGICAL TRAUMA IN PATIENTS WITH SYPHILIS, WITH SPECIAL REFERENCE TO HEALING OF THE POSTOPERATIVE WOUND: W. H. Goeckerman, M.D. (Surgery, Gynecology and Obstetrics, January, 1925). It is pointed out that in general the patient with syphilis is no greater surgical risk than any other. This applies to treated and untreated cases. The exception to this is the group of long standing luetic cases which show cardiovascular and neurological changes.

J. C. POTTER, M.D.

TREATMENT OF PULMONARY TUBERCULOSIS WITH THE HELP OF ARTIFICIAL PNEUMOTHORAX: Sidney F. Blanchet, M.D. (Archives of Surgery, January, 1925, Part ii). Treatment of pulmonary tuberculosis by compression of the diseased lung by artificial pneumothorax has been on trial for over thirty years. The author has made use of this procedure since 1911 and cites 200 cases treated between 1911 and 1922.

In a series of 2,000 cases seen, he felt that this method of treatment was justified in 200 cases, or 10 per cent. These cases were placed in one of two groups:

1. Early or moderately advanced cases.
2. Later or advanced cases.

Ninety-seven of the cases done in the ten years which were in Group II are dead. Twenty-four of the Group I cases are dead. In Group I, six failed to show improvement; 23 were decidedly improved; 29 were able to work.

Influenced by his own statistics the author concludes that lasting results by means of artificial pneumothorax in advanced cases are negative. In moderately advanced cases failing to respond to other forms of treatment, a fairly high percentage of success may be expected from artificial pneumothorax. A feature which predisposes to failure of this treatment is adhesions preventing complete compression. The artificial pneumothorax tends to arrest progressive lesions and to control or prevent recurrence of hemoptosis.

Sanatorium regime is essential along with the artificial pneumothorax if one is to get best results.

If after two or three years the advisability of letting the lung expand is doubted, one may go ahead with a thoracoplasty and produce permanent compression, as compression by artificial pneumothorax for a longer period may predispose to purulent effusion or perforation of the lung.

Artificial pneumothorax has won for itself a definite place in the treatment of pulmonary tuberculosis.

L. D. POWELL, M.D.

Gomenol.—Gomenol is a volatile oil obtained from a plant related to the plant that yields oil of cajuput. It is very similar to oil of cajuput and its therapeutic properties probably are also like it. Gomenol comes as a proprietary from France and it is exploited under extravagant claims. (Journal A. M. A., Oct. 18, 1924, p. 1264.)

PEDIATRICS

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CHESTER A. STEWART,
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MANKATO CLINIC, MANKATO

THE VALUE OF THE CONVALESCENT HOME IN THE MANAGEMENT OF CHOREA MINOR: Harold K. Faber, M.D., and Anna F. Barnett, M.D. (*Archives of Pediatrics*, January, 1925). Fowler's solution and salicylates have been used for many years, with unconvincing evidence of benefit. Chorea runs a largely unpredictable course, even in the absence of therapy. While it is but fair to admit that shock, such as follows the intraspinal or intravenous injection of various substances, particularly proteins, not uncommonly brings about a period of quiescence in chorea of varying duration, and that sedative drugs, such as luminal or magnesium sulphate, have a definite quieting action, the pathology of the disease does not allow us to suppose that such measures can have any but the most indirect curative effect.

The primary need of the choreic is rest. Rest is essentially dependent on quiet, and the maximum of quiet is unobtainable in town, where noise is practically incessant. The country has another advantage over town in being able to offer a great accessibility to sunlight. While the systemic effects of sunlight are still little understood, it may at least be stated that heliotherapy has important beneficial effects on the body which increases its resisting powers against infectious disease, promotes certain metabolic processes, including growth, normal bone formation, and the healing of wounds, and increases blood regeneration. With the establishment of the Kate D. McLaughlin Unit of the Stanford Convalescent Home it was for the first time possible to send to the country early convalescents and other children still, for one reason or another, in need of bed rest and a certain amount of nursing care. The diet is abundant and well balanced, with emphasis on milk, fresh fruits, green vegetables. Graduated heliotherapy by a slightly modified Rollier schedule is given in the morning hours. Twelve hours' sleep during the night and a two-hour afternoon nap are assumed.

In general, it is clear that, as compared with experience in home or hospital treatment, the hygienic, or expectant, treatment of chorea in a convalescent home with facilities for continued bed rest and isolation, if it is needed, can usually be relied upon for recovery. The facilities of the convalescent home allow bed rest with nursing care until symptoms have entirely subsided—a period of four to ten weeks in severe cases—and a further period of ambulatory care with the patient still under supervision, during which he can regain his full strength. The maintenance of nutrition and the insistence on liberal periods of sleep and rest are of the utmost importance.

R. N. ANDREWS, M.D.,

BERTRAG ZUR GOLDLICHHANDLUNG DER TUBERKULOSE: L. Richman, *Munich Med. Wochenschr.*, Nr. 46, Nov. 1924. 71 Jahrgang. In 1890 Robert Koch demonstrated the inhibitory effect of potassium gold cyanide on the growth of the tubercle bacilli. Feldt later made numerous culture experiments and demonstrated that this effect came from the gold component and proved that colloidal gold prevented growth in a dilution of 1 to 1,000,000, while potassium cyanide inhibited growth in a dilution of 1 to 1,000. He also showed that Aurocantan was one-half as toxic as potassium gold cyanide and, therefore, was tolerated in twice the dose. Gold compounds were effective only in case the metal was available in colloidal solution. Another substance, Krysolgan, is only one-sixth as toxic as Aurocantan, but the injurious effects in man from its use have made physicians skeptical about its value. Through findings that smaller doses of Krysolgan influence tubercles as favorably as larger doses, the complications resulting from its use in form of toxicodermias, gastric disturbances and other symptoms may be reduced to a minimum. The gold preparation Triphal has properties similar to those of Krysolgan but is definitely less toxic. It differs chemically from Krysolgan in that it is a more stable compound. In the former gold is more easily split off.

No injurious effects have been experienced to date after four years' use of Triphal. Very small doses stimulate connective tissue development and hasten healing processes, a fact which has been noted in frequent examinations of the larynx.

Gold therapy is indicated especially in lesions where there is a tendency toward connective tissue development, that is, when the process is largely productive. In destructive processes it is not so satisfactory, for reactions occur very easily with wider spreading of the tuberculous process. The slowly progressive cases are most suitable for treatment as are also stationary or retrogressive cases. The gold therapy is indicated in laryngeal and pulmonary tuberculosis in the absence of acute progressive lesions.

Other authors are of the opinion that gold therapy is of value in skin, bone and joint tuberculosis.

C. A. STEWART, M.D.

IGNORANCE AND NEGLIGENCE AS FACTORS IN DEATHS FROM DIPHTHERIA: E. C. Fleischner, M.D., and E. B. Shaw, M.D. (*Archives of Pediatrics*, January, 1925). Can pediatrics justify the ignorance responsible for the tremendous ravages of diphtheria? The honest attitude of the medical man toward his patient should be a definite one. If he does not know what the trouble is, he should know what it is not. There is no location in the body where the pathological processes vary so rapidly and where a few hours may serve to clarify an hitherto obscure diagnosis. This is particularly true in diphtheria, and especially so in the severe type where early treatment is so essential. Rapid necrosis of the superficial tissues adjacent to the existing membrane, particularly if this is associated with edema, is almost pathognomonic of the action of the diphtheria toxin. Direct smears should not be neglected where the time element is so vital. In the

practice of pediatrics all sore throats should be cultured immediately. The blood serum should always be examined before being used and if it is dry it should be discarded. The tubes should always be kept in the erect position. To content oneself with taking a culture in the morning and resting contentedly under the delusion that one has fulfilled one's duty to his patient until a report is received on the following morning is either an evidence of insanity or unintentional malpractice, both of which are unfortunately only too frequently encountered. One must realize that negative culture reports may be received in cases of diphtheria. There is absolutely no excuse for delay in any doubtful case. Harm cannot come from unnecessary treatment; irremediable disaster may result from only a few hours of procrastination. Antitoxin is rendered available 10 times as rapidly by the intravenous route as by the subcutaneous route and four times as rapidly as by intramuscular injection.

In conclusion, for practical purposes, it may be stated that every death from diphtheria is preventable and avoidable. If this is true the enormous number of deaths each year must be attributed either to ignorance or negligence. Intensive education of the laymen and conscientious study on the part of the medical advisor will do much to combat this lamentable situation. Facts at times are disagreeable, but the facing of them and a grim determination to eradicate them will do much to mitigate the ravages of diphtheria.

R. N. ANDREWS, M.D.,

ZUR FRAGE DER INTRAPERITONEALEN BLUTINFUSION: Hans Opitz and Felix Metis (*Jahrbuch für Kinderheilkunde*, Berlin, 107, 269-290, Dec. 2, 1924). Opitz and Metis, using a small series of animals, have shown experimentally that citrated or defibrinated blood, when injected into the peritoneal cavity, is absorbed into the general circulation. They found that absorption began in some animals in a few hours and was completed in 16 to 96 hours. They believe that the red blood cells so injected are absorbed unchanged and therefore are in a functioning condition. At autopsy there was neither evidence of adhesions nor injury to peritoneum or abdominal viscera. A clinical investigation on thirteen infants further substantiated their animal experimentation, and they concluded that the intraperitoneal blood infusion is a practical substitute for the intravenous blood transfusion and causes fewer secondary reactions.

The beneficial results of intraperitoneal blood transfusion depend upon a rapid rate of absorption from the peritoneal cavity. The slow rate of absorption observed by Opitz and Metis, as noted above, is probably due to the fact that they used for transfusion, blood which had stood for $\frac{1}{2}$ to 192 hours. In the experiments of Siperstein and Sansby (*Am. Jour. Diseases of Children*, Vol. 25, No. 2, February, 1923), it was shown that freshly prepared citrated blood injected immediately was completely absorbed from the peritoneal cavity within 5 hours,—absorption beginning within 15 minutes. Our observations, moreover, were based on a study of a larger series of animals and therefore were in many respects more conclusive.

J. MARTIN SANSBY, M.D.

TRANSFUSION THROUGH THE UMBILICAL VEIN IN HEMORRHAGE OF THE NEW-BORN—J. Buren Sidsbury (*Amer. Jour. Dis. of Child.*, April, 1923): The use of human blood as a therapeutic agent in melena or hemorrhagic disease of the new-born has been one of the gratifying advances in medicine during the last decade. Human blood has acted as a specific in this condition. The etiology is not known. Hypoplasia of the coagulating elements of the blood may be a factor. From 2 to 6 per cent of these cases are syphilitic, according to Holt. Infection seems to act as a predisposing factor. From observation, we note that babies that have been more or less asphyxiated have a tendency to bleed. Trauma, such as is frequently suffered in difficult deliveries, and the common methods of resuscitation may well be exciting causes. Lucas and Dearing by the vital dye method demonstrated that the blood volume in infants was about one tenth of the body weight. If we use this as a basis, an infant has one ounce of blood to each pint in the adult. If we bear this relationship in mind, we may better appreciate what the loss of a few ounces of blood means to an infant. The author gives 100 c.c. of blood through the umbilical vein. The umbilical vein may be patent and accessible for transfusion up to, and including, the fourth day of life. The umbilical vein up to the fourth day is the most accessible vein in a new-born baby, if patent. The probability of a clot in the umbilical vein is very unlikely because the blood is fluid many hours after death in these cases. Transfusion through the sinus in cases of intracranial hemorrhage may increase intracranial pressure, which is not desirable. Transfusion through the superior longitudinal sinus is comparatively simple for one experienced, while the umbilical route is simple for those inexperienced in the sinus route. In the author's experience, the median basilic vein is always large enough to admit an 18 gauge needle in infants as young as 2 or 3 weeks, and is preferable to the superior longitudinal sinus usually; but it is necessary to dissect it out.

R. N. ANDREWS, M.D.

THE CONSERVATION OF HEARING IN THE SUPPURATIVE MIDDLE EAR DISEASES OF CHILDHOOD: Ralph Almoun, M.D., New York City, N. Y. (*Medical Journal and Record*, vol. 120, No. 12, Dec. 17, 1924). A properly made incision into the drum, in suppurative otitis media, will remain open as long as there is any pus in the middle ear. The resulting scar seldom causes any impairment of hearing. Multiple or repeated incisions into the drum are not desirable, injuring the drum permanently, and will not relieve a mastoiditis if already developed. The author believes that mastoiditis may heal spontaneously, not because of the drainage afforded through multiple openings in the drum, but through the natural ability of the patient to combat infection.

Suction is regarded as a valueless and dangerous method of treatment, and delays recovery.

Cases of mastoiditis which apparently subside spontaneously, but continue to have a prolonged aural discharge, generally should have a simple mastoid operation. Cases of chronic suppuration, attended by marked impairment of hearing, can generally be improved by a simple mastoid operation. The radical operation is rarely necessary in

children even where bone necrosis and danger of intracranial invasion is suspected.

Chronic suppuration of the tympanic mucosa usually occurs where a central defect exists in the drum, and presents an intermittent discharge, which recurs in the presence of infections of the upper respiratory passages. Such cases should have treatment directed toward the sources of infection in the nose and throat, as well as improving the general resistance of the body. Local treatment of the ear merely allays the individual attack.

THOS. MYERS, M.D.

THE USE OF SULPHARSPHENAMINE IN THE TREATMENT OF CHOREA: Rudolph D. Moffett, M.D. and Carl H. Smith, M.D. (*Archives of Pediatrics*, September, 1924). From earliest time chorea has been treated by the use of arsenic. The first use of arsenic, probably Fowler's solution, in the treatment of chorea is mentioned in 1826 by Gregory. Although it has been shown that chorea is rarely associated with syphilis, salvarsan has been employed in its treatment. In 1912, they treated a case of hemichorea with one injection of salvarsan, intravenously. There was an immediate cessation of the choreiform movements and a complete recovery of this patient.

The authors' method of treatment consists in placing the child in bed for 24 hours. The next day the child is given an intramuscular injection, usually into the buttocks, of 10 mg. of sulpharsphenamine for each kilo of body weight. The total quantity usually averages 0.2 to 0.3 gm., dissolved in 0.8 to 0.9 c.c. of distilled water. This dose is usually repeated at intervals of five days until three doses have been given. They have never observed any local inflammatory reaction at the site of injection, although in one child a scarlatiniform eruption followed. In two of their cases there was a rise in temperature to 102, which subsided in 24 hours. In all they have treated nine cases of chorea in children with this method. Of these, five showed definite clinical improvement.

In a disease as stubborn as chorea, where a beneficial effort is derived from medication, particularly when so readily administered, sulpharsphenamine is worthy of further consideration and study.

R. N. ANDREWS, M.D.

centas with the membranes; a positive Bordet-Wassermann reaction having been obtained in 41 cases or 82 per cent of the series. Although their work largely confirms the well-known findings of others, they explain many of the clinical conditions which are observed in these cases.

The syphilitic placenta is of friable consistence and tears or breaks easily, which explains the frequency of retention of fragments; 50 per cent in their experience. Edema with a sero-sanguinolent fluid is almost constant and is explained by the vascular changes to be described. The weight of the placenta in relation to that of the fetus is always increased—from 14 or 16 per cent to 25 or even 50 per cent of the fetus. Infarction, generally involving the fetal surface, was found in 32 per cent of their series.

Microscopically these authors note almost constant decrease in the size of the maternal blood spaces. The villi are thickened, due to hypertrophy of the syncytial and Langhans cells. These changes are believed to be a causal factor in the production of premature labor. The vessels of the villi, arteries and veins, show a thickening principally involving the tunica interna in such a manner as to predispose to thrombosis, and obliteration. The media and adventitia are also thickened. In some instances they describe the development of varicosities to a degree resembling angiomatous structures. The vascular changes in the villi lead to poor circulation, anemia and necrosis of the tissues, involving at first the endothelial cells of the villi. This results in coagulation of the maternal blood and the complete shutting off of the areas involved. Such changes were found as microscopic lesions in 80 per cent of the series, but may also be found in other conditions.

In the maternal portion of the placenta they found extensive infiltration of leucocytes forming islands or strands of cells about the vessels, and replacing decidual cells.

The chorion is also infiltrated and shows true syphilitic inflammatory reaction. The amnion presents characteristic inflammatory changes, with hypertrophy of the endothelial cells, resulting in marked thickening. The authors have observed no constant relationship between the occurrence of such changes and the presence of excessive amounts of amniotic fluid. In the cord, they describe an edema present in cases of maceration of the fetus, and in some instances there was also a development of varicosities. However, they do not regard the latter findings as characteristic of syphilis. Microscopically, they noted a marked panarteritis and phlebitis, sometimes amounting to almost complete occlusion of the vessels. In 36 per cent of the series, a marked infiltration of Wharton's Jelly was found, which they designate as syphilitic funiculitis.

The syphilitic lesions of the placenta and cord explain the occurrence of abortion or premature labor in the absence of actual infection of the fetus. They discuss the rather academic question as to whether syphilis causes first the death of the fetus, and subsequently its expulsion from the uterus; or whether it results in the premature expulsion of a living fetus. Ordinarily and especially in cases of recent infection of the mother, the product of conception is killed, and is subsequently expelled; as is observed in other acute infectious processes. In instances where the syphilitic infection is more remote, the fetus is

GYNECOLOGY AND OBSTETRICS

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THE HISTO-PATHOLOGY OF THE SYPHILITIC PLACENTA AND ITS CLINICAL SIGNIFICANCE: C. Monkeberg and M. Aviles, Univ. of Chili, *Gynecology et Obstetrique*, May, 1924. This report is made from an intensive gross and microscopic study of 50 syphilitic pla-

expelled living, but is already handicapped, as a result of the circulatory disturbances.

Since search for the spirochetes in the fetus is not always successful, some authors deny such causal relationship. However, these workers emphasize the fact that the cause is only indirect. That is, the fetus perishes because of syphilitic changes in the placenta and vascular system. In some cases the characteristic lesions are rather more marked in the decidua and endometrium, and are sufficient to explain the death of the fetus or the abortion, since the trophoblast is unable to retain its usual relationship. Some of the cases of fetal death close to term may be explained by the changes in the umbilical cord.

The explanation for the frequent occurrence of hydramnios in cases of syphilis is not absolute, but the authors suggest: the possibility of excessive tension in the fetal and placental circulation due to enlargement of the fetal liver and compression of the umbilical veins. They also suggest the causal relationship of changes in the cord, or more directly a reaction from syphilitic inflammation of the amnion.

The increased maternal morbidity of the puerperium is explained by the syphilitic changes in the placenta and decidua, leading to retention, hemorrhage and sepsis.

Since the spirochetes are commonly found in the fetus, and infection is usually maternal or at least mixed, one should expect to find the organism in the placenta. However, in spite of many attempts by various workers, such positive findings are exceedingly rare, either because of technical difficulties, or of rapid destruction of the organisms. The authors were unable to demonstrate them in any of their cases.

A. L. McDONALD, M.D.

DIFFUSE HYPERPLASIA OF THE DECIDUA AND HEMORRHAGE AT THE END OF GESTATION: A. Riotte (*Gynecologie et Obstetrique*, Vol. IX, No. 1). The term "Decidual Endometritis" includes a variety of abnormal conditions which require differentiation. The decidua basalis, because of the active relations of the maternal and fetal elements, occupies a special position. The decidua reflexa is rarely concerned, but the decidua vera is rather often involved in a variety of processes. In former times, following the teachings of Ruge, these were considered as inflammatory, and were described as being: glandular, interstitial, or mixed. Recently, as has been the case with conditions of the endometrium aside from pregnancy, it has been necessary to divide these conditions into the bacterial and non-bacterial. Among the non-bacterial forms we find a type characterized by changes in the decidua vera, "hyperplastic decidual endometritis." This may be found localized, forming polyps, more or less pedunculated and described first by Virchow. These are seen in ova of from three to four months expelled by abortion. The etiology is not definitely proven though syphilis has been commonly accepted as a frequent cause. There is also a diffuse form in which the thickened decidua is adherent to the fetal membranes over extensive areas, or where large portions of decidua are expelled during delivery at full term. The author presents a detailed report of a number of such cases with a study of the histological character of the tissue.

These concern instances where there was more or less extensive hemorrhage preceding or during labor, in at least one case suggesting placenta previa; and in which large portions of decidua were found adherent to the fetal membranes, or were expelled separately.

The author describes three histologic pictures as shown in the specimens examined: 1. The decidua shows a development corresponding to that of the third or fourth fetal month with but slight signs of degeneration. 2. In a second group the glandular hypertrophy has disappeared, and there is much degeneration in the superficial layers; there is still marked cellular hyperplasia; there is marked development of the blood vessels with hemorrhage into the tissues; and one finds evidence of persisting chorionic villi. 3. This represents a terminal stage, and one finds evidence of marked degeneration of the hypertrophied decidua which has not entirely disappeared. This persists most often near the lower pole of the ovum.

In explaining the causal factors, the author concludes that, in spite of the frequent finding of leucocytic infiltration, inflammation is not the cause. After discussing the histological picture, together with the clinical course, he concludes that the condition represents a delay in the normal physiological regression of the decidua and is due to constitutional factors, probably endocrin disturbances. He accepts the explanation of Vignes and Cornil that the condition is due to thyroid deficiency which causes a marked congestion of the endometrium and thus explains the hypertrophy of the decidua, and delay of normal retrogression. Clinically the condition may be associated with minute hemorrhages into the decidua or external hemorrhage. This explains the occasional cases which give a history of loss of blood during pregnancy, which in some instances resembles menstruation. Since the condition is most marked at the lower pole of the ovum where the delicate, enlarged vessels are easily disturbed, bleeding late in pregnancy or early in labor may occur to a degree suggesting placenta previa.

ARCHIBALD L. McDONALD, M.D.

THE POST-CLIMACTERIC METRORRHAGIAS CAUSED BY TUMORS AND CYSTS OF THE OVARY. THE PHENOMENON OF REACTIVATION OF THE SENILE UTERUS OF OVARIAN ORIGIN: P. Moulon-guet-Doleris (*Gynecologie et Obstetrique*, Vol. IX, No. 6). While accepting the classical teaching that post-climacteric bleeding is pathognomonic of cancer of the uterus, the author shows that this symptom may also be caused by solid or cystic tumors of the ovary. He has collected 52 such cases including 26 unpublished observations. This type of bleeding was observed in 20 per cent of 74 cases of ovarian neoplasm which developed after the menopause.

The type of bleeding is variable; sometimes a single profuse hemorrhage with or without pain; sometimes it is repeated with a certain degree of periodicity; but most often it is irregular in time and amount, extending over several weeks or months. There is often a profuse leucorrhea. On bimanual examination the ovarian tumor may not be discovered either on account of its small size, or because of thick abdominal walls. In other cases a mass in the broad ligament or a large abdominal tumor which is often accom-

panied by ascites, may suggest inoperable cancer unless the possibility of this type of metrorrhagia is kept in mind.

The symptom has been observed in association with all forms of ovarian tumor. The majority of the author's cases were due to benign tumors, so that the prognosis is usually good.

In 7 cases a minute study of the endometrium was made and demonstrated a marked hypertrophy of the mucosa in five specimens. The hyperplasia may be general or localized and small polyps are described. Either the glands or the stroma may be involved and the reaction resembles that of the premenstrual period. There seems to be a rejuvenation of the endometrium involving all of the constituents, and which is followed by the normal sequences: hemorrhage and leucorrhea.

The author discusses the pathogenesis with considerable reservation. Since the associated growth may be either unilateral or bilateral, and since the ovarian tissue may be more or less completely destroyed, he eliminates the influence of hormones. Because of the varying size of the tumors, mechanical pressure is not a factor. Since many of the growths were in the broad ligament, and because of the rather frequent association of torsion of the pedicle, he suggests that the bleeding is due to disturbances in the nervous plexus in the broad ligament, and trophic action upon the senile uterus.

In the diagnosis the demonstration of a palpable ovarian tumor should suggest the possible association. Several of the reported cases had been erroneously considered as uterine fibroids causing post-climacteric bleeding. It is generally agreed that simple uncomplicated fibroids do not become active after the menopause has been established.

The presence of ascites is likely to lead to the diagnosis of inoperable cancer, and is most unfortunate since many of the ovarian tumors which presented this symptom were benign and easily operable.

In the cases with small ovarian tumors which are not palpable, the condition is likely to be explained as cancer of the uterus.

A diagnostic uterine curettage may be necessary to exclude uterine cancer. Most of the cases were treated surgically with removal of the uterus and the tumor, though in some instances removal of the ovary will be sufficient. The use of radium is contra-indicated.

A. L. McDONALD, M.D.

IS IT POSSIBLE FOR THE CORPUS LUTEUM TO BE A SOURCE OF PROFUSE INTRA-PERITONEAL HEMORRHAGE: G. Schickele (*Gynecologie et Obstetrique*, Vol. IX, No. 1). Although the clinical and pathological picture of extra-uterine pregnancy is well recognized and generally accepted, there have been described numerous instances of severe intra-peritoneal hemorrhage, in which there was no demonstrable evidence of extra-uterine pregnancy. It has been assumed that such hemorrhage came from a ruptured follicle or corpus luteum cyst. It is probable that in many instances sufficient care has not been taken to exclude the presence of an ectopic pregnancy, since this may leave very slight evidence. Some authorities even deny the possibility of such a hemorrhage

in the absence of extra-uterine pregnancy. The author reviews in detail an extensive article by M. Forssner of Stockholm (*Acta Gynecologica Scandinavica*, Vol. 1), in which extremely rigid requirements are laid down in order to exclude a pregnancy. Forssner demands that serial sections of the anatomical specimen exclude the presence of any fetal tissue or decidua; also that a similar systematic examination be made of all of the blood clots in the peritoneum, since the product of conception may have been entirely expelled from the tube. Forssner also believes that some of the cases represent instances of ovarian pregnancy. The author is inclined to agree with Forssner that in many reports insufficient data are given to absolutely exclude extra-uterine pregnancy, but believes that his requirements are too rigid, since it would always be possible to claim that the product of conception had been extruded and overlooked. Neither can he agree that all of the others represent instances of early ovarian pregnancy. Schickele reports the detailed description of three instances in which pregnancy was excluded and presents positive evidence of, and an explanation for, changes in the corpus luteum which are sufficient to cause profuse intra-peritoneal bleeding. He demonstrates that there has been a degeneration in the granulosa layer in such a manner that the entire corpus luteum is forcibly separated from the theca interna and is expelled, leaving a number of the vessels torn and bleeding. The author therefore concludes that in a few instances positive proof may be furnished to explain such profuse intra-peritoneal hemorrhages from the corpus luteum in the absence of pregnancy.

ARCHIBALD L. McDONALD, M.D.

ROENTGENOLOGY

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APPARENT AND REAL DELAY OF EPIPHYSEAL DEVELOPMENT IN RICKETS: Hans F. Plaut (*Fort. a. d. Geb. d. Roentgenstrahlen*, Vol. 32, p. 563, Dec., 1924). Roentgenologically visible epiphyses present before the onset of rickets are unaffected by mild types of the disease. In severe cases, the epiphyses are affected in various degrees so that the shadows appear much less dense and more hazy in outline. As improvement occurs, the intensity of the shadow increases from the center to the periphery, leaving a border of hazy contour, the thickness of which depends on the duration and severity of the disease. In very severe cases, epiphyses which were previously recognizable in the roentgenogram may disappear, to reappear when repair takes place.

Newly appearing epiphyses are unaffected in mild cases. In severe cases, during the acute stage, new epiphyses do not appear. This delay is only apparent, being due to the roentgen technique, the density of the epiphyses being no greater than the surrounding tissue, and therefore

not being visible in the roentgenogram. This is demonstrated by the sudden appearance of large well developed epiphyses in the roentgenogram within a few days after improvement has begun.

Only when the disease is so severe as to produce a general interference with body development, do the epiphyses actually fail to develop within the normal time. This occurs in about half of these cases. The true character of this delay is shown by the absence of epiphyses for some time after improvement has begun and their appearance as small nuclei when first seen.

LEO G. RIGLER, M.D.

THE END RESULTS IN ROENTGEN RAY TREATMENT OF CUTANEOUS CANCER: Hazen and Whitmore (Am. Jour. Roent., vol. xiii, p. 144, Feb., 1925). In 160 patients afflicted with 244 basal cell carcinomas, 84 per cent of the patients and 88 per cent of the tumors were cured by roentgen irradiation. Ninety-three per cent of selected cases and 96 per cent of selected tumors were cured.

Deep ulcers or nodules, growths on the ear and in cartilage, older growths and larger growths all are more difficult to treat. Cures were obtained in 50 per cent of previously treated cases.

The results from roentgen rays are approximately the same as those obtained from radium or excision.

Apparently an increase in dosage from 1½ units to 2½ units did not produce a greater percentage of cures. The authors used unfiltered rays in all superficial lesions.

The cosmetic results were good; there were very few dele-

terious effects, chiefly telangiectases; 94 per cent of all recurrences came in the first year.

A small number of prickle cell carcinomata showed 45 per cent cures. A few cases of carcinomatous glands showed 41 per cent cures.

The authors present a review of the theories explaining the mode of action of radiation upon carcinoma. Some of their observations lead them to believe with Murphy and others that the effect is upon the healthy tissues, not upon the cancer cells themselves.

LEO G. RIGLER, M.D.

TWO CASES OF TYPICAL OSTEOCHONDROPATHY OF THE MEDIAL SESAMOID BONE OF THE FIRST METATARSAL: Alex Renander (Acta Radiologica, vol. iii, p. 521, Dec., 1924). Two cases of pain in the feet are presented. In both there was no history of injury and weight bearing caused the pain to appear.

Roentgen examination revealed a hitherto undescribed condition affecting the medial sesamoid of the first metatarsal. The bone was flattened, showed evidence of pressure deformity from the head of the metatarsal, and was fragmented. The outlines of the bone were hazy and areas of increased density were present.

One of these was extirpated and the microscopic picture was very similar to that of osteochondritis juvenilis deformans. The roentgen appearance is also so similar that the author classifies this condition with that group of osteochondropathies which include Legg-Perthe's, Schlatter's, and Kohler's disease.

Both patients recovered fully, one following rest, the other extirpation of the affected sesamoid.

LEO G. RIGLER, M.D.

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Neubeiser, Ben Lawrence.....	U. of Minn., M. B., 1924.....	St. Mary's Hospital, Duluth.
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Zachman, Albert Herbert.....	St. Louis U., M. D., 1924.....	St. Mary's Hospital, Minneapolis.

THROUGH RECIPROCITY

Blanton, Smiley	Cornell, M. D., 1914.....	Lymanhurst Hospital, Minneapolis.
Burman, Guy Elmer.....	U. of Neb., M. D., 1918.....	Rochester, Minn.
Busby, James Leslie.....	Starling-Ohio, M. D., 1913.....	Rochester, Minn.
Combacker, Leon Clinton.....	U. of Mich., M. D., 1909.....	225 7th Ave. S. E., Minneapolis.
Graves, Waldo Neil.....	Rush, M. D., 1924.....	1645 Hennepin Ave., Minneapolis.
Hall, Henry Homer.....	Hamline, M. D., 1908.....	Webster, Wis.
Kenefick, Emmett Vincent.....	U. of Ia., M. D., 1923.....	Church Club, St. Paul.
McKnight, Roy Bowman.....	U. of Pa., M. D., 1920.....	Rochester, Minn.
McManus, Clara	Sioux City Col. Med., M. D., 1902.	446 McKnight Bldg., Minneapolis.
Morton, Charles Bruce.....	U. of Va., M. D., 1922.....	Rochester, Minn.
Schulz, Irwin Wm. Paul.....	Marquette, M. D., 1924.....	Rochester, Minn.
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Shippey, Stuart Hunter.....	Emory U., M. D., 1923.....	Rochester, Minn.
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Blomberg	Dr. of Med., 1915.....	Eau Claire, Wis.

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Fink, Walter Henry.....	U. of Minn., M. D., 1921.....	301 Phys. and Surg. Bldg., Minneapolis.
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BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

PEDIATRICS. The Practical Medical Series. Vol. IV.

Edited by Isaac A. Abt, M.D. 381 pages. Illustrated.

Cloth, \$2.00. Chicago: The Year Book Publishers, 1925.

DISEASES OF THE RECTUM AND PELVIC COLON.

Martin L. Bodkin, M.D., F.A.C.S., New York. Illustrated.

2nd edition, revised, and enlarged. 487 pages. Cloth,

\$6.00. New York: E. B. Treat & Co., 1925.

THE TECHNIC OF LOCAL ANESTHESIA. Arthur E.

Hertzler, A.M., M.D., Ph.D., LL.D., F.A.C.S., Kansas City,

Kansas. 3rd edition. 272 pages. 140 illustrations.

Cloth, \$5.50. St. Louis: C. V. Mosby Company, 1925.

ANNUAL REPRINT OF THE REPORTS OF THE

COUNCIL ON PHARMACY AND CHEMISTRY OF

THE AMERICAN MEDICAL ASSOCIATION FOR

1924. Cloth. Price, postpaid, \$1.00. 82 pages. Chi-

cago: American Medical Association, 1925.

This volume contains the reports of the Council on Pharmacy and Chemistry that have been adopted and authorized for publication during 1924. Some of these reports have appeared in The Journal of the American Medical Association. Others are now published for the first time.

The annual volumes of the "Council Reports" may be looked on as the companion volumes to New and Non-official Remedies. While the latter contains the medicinal preparations that are found acceptable, the reports contain the reasons why certain products were not accepted. Thus the present volume contains reports on the following products which the Council denied admission to New and Non-official Remedies: Aolan; Aspatol; Atussin, Peptoproteasi, Paraganglina Vassale, Fosfoplasmina, Asmoganglina and Endo-Ovarina Tablets; Borosodine; Carsinol; Colodine and Colobromidine; Ferrasin; Glyeuthymenol; Hoyt's Gluten

Flakes; Iodeol; Loefflund's Food Maltose; Mistura Creosote Comp. (Killgore's) and Tablets Cascara Comp. (Killgore's); Neo-Riodine; Nicomors; Peptone Solution for Hypodermatic Use (Armour); Pivalbol; "P-O-4"; Pollantin; Promonta; Pruritus Vaccine Treatment-Lederle (Montague Method); Restor-Vin; Some "Mixed" Vaccines of G. H. Sherman and Tersul Hiller.

The volume also contains reports on products which were included in former editions of New and Non-official Remedies but which will not appear in the 1925 edition because they were found ineligible for further recognition. Among these are polyvalent antipneumococcic serum, colon bacillus vaccine, gonococcus serum and gonococcus vaccine.

The volume contains a number of reports of a general nature: for instance a report on the therapeutic value of benzyl benzoate; a report on anaphylaxis produced by thromboplastic substances and a report on the therapeutic use of digitalis.

Physicians who keep fully informed in regard to the value of proprietary remedies will wish to own this book.

BLOOD CHEMISTRY. COLORIMETRIC METHODS, FOR THE GENERAL PRACTITIONER. By Willard

J. Stone, M.D., Pasadena, Cal., Attending Physician, Los

Angeles Gen. Hospital. First Edition 71 pages. New

York: Paul B. Hoeber, Inc. \$2.25.

The colorimetric methods described in this book for the important constituents of the blood are some of the best available at the present time. It is to be regretted, however, that the author has not mentioned the aeration method for the determination of urea. The general practitioner is not a trained technician and very often the urea determination by the described method fails.

This book has nothing original and is not in any respect an improvement over some of the larger treatises on the subject.

WM. W. SWANSON, M.D.

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MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association
Northern Minnesota Medical Association and Minneapolis Surgical Society*

VOL. VIII

MAY, 1925

No. 5

A CLINICAL DISCUSSION ON RAMISECTION*

A. W. ADSON, M.D.

Surgical Section on Neurology

Mayo Clinic, Rochester, Minnesota

I feel rather incompetent to present the subject of Ramisection for Spastic Paralysis when Drs. Royle and Hunter, of Sydney, Australia, who devised this operation on the sympathetic nervous system, have so recently been in this country and have presented the subject so thoroughly from its experimental as well as from its clinical aspects. The presentation of their work has awakened in us great interest, and in consequence thereof we have operated upon a number of patients suffering from various types of paralysis, with varied results. We have been particularly impressed with the fact that it is possible, by means of ramisection, to reduce the spasticity in a selected group of these cases.

Boeke demonstrated that voluntary muscles are supplied by non-medullated fibers from the sympathetic nervous system in addition to the medullated fibers from the anterior horn cells. Considerable speculation and investigation have been directed to ascertaining the function of these sympathetic fibers. Langelaan, accepting De Boer's results, maintained that the sympathetic nerves were concerned with the maintenance of plastic tone, whereas the ordinary medullated nerves were concerned with the production of contractile tone. It was felt by De Boer, Langelaan and Kuno that the results obtained from section of the sympathetic fibers were due to the effects of vaso-dilatation in the limbs deprived of their sympathetic supply. A much more important criticism of De Boer's results arises from the experiments of Dusser de Barrenne, Van Rijnberk and Cobb, who found that section of the sympathetic nerve fails to influence the development and maintenance of decerebrate rigidity. This condition appears in animals after

section of the brain in the mesencephalon and is generally admitted to be due to a great increase in the tone of the muscles sustaining the animal against the effect of gravity. If the sympathetic nerves have anything to do with tone or with hypertonicity, the effect of their removal should be noticeable in decerebrate rigidity.

Three sets of experiments were carried out by Dr. Royle, the first consisted of a sectioning of the cord, followed by a left lumbar sympathectomy; the second, a left lumbar sympathectomy without section of the cord; the third, a lumbar sympathectomy followed by decerebration. It was found that goats responded much more satisfactorily than did rabbits, cats, or dogs. The results obtained proved definitely that the sympathetic nerves play an important rôle in the maintenance of plastic tone.

In carrying out experimental studies in the development of this work, certain observations have been made: (1) Ramisection is of value in relieving spasticity of cerebral origin, unassociated with ataxia or tremor, and is indicated in patients who have good mentality, are able to stand or to sit up alone, and who are of sufficient age to co-operate in the postoperative treatment; (2) it is not indicated in cases of Parkinson's disease or paralysis agitans; neither is it indicated in the presence of muscular involvement of the pharynx or larynx. We have operated upon two patients suffering from paralysis agitans; in one we did a cervical ramisection, and in the other a lumbar ramisection. Our results, in both instances, were disappointing inasmuch as it was impossible to arrest the tremor or to check the progress of the disease. However, ramisection does diminish spasticity in the extremities of patients who have difficulty in walking or in using the arms and hands, and is indicated when such spasticity interferes with the normal movements of the extremities.

Case 1 (L. G.). A boy, 6.5 years of age, who gave a history of Little's disease with moderate involvement of all extremities and hands. While he was able to walk with some difficulty, he was unable to write or to feed himself.

*Presented before the meeting of the Minneapolis Surgical Society, Dec. 11, 1924.

The parents of this boy were teachers and had made every attempt by means of massage, passive motion, muscle training and exercise to improve his condition. The left arm and hand were less spastic than the right, and a great deal of attention had been paid to the treatment of this hand, but even at his age he was unable to make a straight line or to print or to write a legible letter or number. We felt justified in doing a right cervical ramisection, and removed the superior, middle, and inferior ganglia with all of the rami, explaining to the parents that a Horner's syndrome, or a contracted pupil with an endophthalmus, would result. On the fourth day postoperatively, the boy said to his mother, "Mamma, my hand is not tight any more," and on the sixth day postoperatively, of his own accord, placed a pencil in his right hand and made legible numbers and letters; the boy knew his alphabet and his numbers, but had been unable to write.

At a second operation, a similar procedure was applied to the left cervical ganglia and rami, when it was interesting to note that the same thing occurred on the left side as had occurred on the right, and the boy now transferred the pencil to the left hand, with which he had been trained to write, and found that he could write better with the left hand than with the right. Since operation, this boy has continued to improve and at the present time he can write as distinctly as any child of his age and can also feed himself with a spoon.

Similar results have been obtained in operations upon the lumbar sympathetics.

RESUME

While the work in this field is still in its experimental stage so far as the surgical indications and the surgical application are concerned, the results obtained are convincing that the operation is of definite value in diminishing spasticity or releasing plastic tone, and is indicated in a selected group of patients with fair mentality and muscular control. The operation will not restore function to a paralyzed extremity. Contractures and deformities must be corrected by orthopedic measures either before or after the operation, and in addition massage, passive motion, and exercises must be carried out. The statement may be advanced that inasmuch as orthopedic measures will relieve some of the spasticity, ramisection has no surgical indication. It is true, ramisection is not indicated in patients who can be relieved by orthopedic measures or by Stoffel's operation, but when these have been tried and found to fail, ramisection is a procedure which can be employed in the hope of accomplishing something for the spastic individual.

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- Royle, N. D.: A new operative procedure in the treatment of spastic paralysis and its experimental basis. *Med. Jour. Australia*, Jan. 26, 1924, pages 77-86.

DISCUSSION

DR. GEIST (Minneapolis): We are very grateful to Dr. Adson for having come to Minneapolis and given us such a clear exposition of "The Australian Operation" and his comments thereon. Dr. Adson's attitude is certainly the safe and sane one.

In discussing this operation we must not forget that in past years we have already employed many other types of operations in these cases of spastic paralysis and we have succeeded in improving the physical condition of many patients afflicted by this disease. I am sure Dr. Adson does not intend to give us the impression that the operation under discussion this evening is intended to supersede entirely those measures which I have in mind. Briefly the operations which we have been doing up to this time are as follows:

First, Tendon Lengthening (either subcutaneous or by the open method). It has been found that actual lengthening of a tendon in some way or another reduces to a greater or less extent the spasticity present in the affected muscle. Tenotomies in these cases cannot be entirely discarded.

Second, The Foerster Operation. This operation was devised somewhat over twenty years ago by Foerster of Breslau. It consists of dividing some of the sensory roots, chiefly in the lumbar region. It is a difficult operation and not devoid of considerable risk and results on the whole have not been gratifying; nevertheless, in certain cases it has proven of benefit.

Third, The Stoffel Operation. This consists of dividing a portion of the sensory section of certain peripheral nerves (chiefly in the lower extremities) and is an operation which at the present time is very popular among orthopedic surgeons. Bruce Gill, of Philadelphia, at the last meeting of the Orthopedic Association reported a large number of cases (something over 100) with, on the whole, excellent results. The Stoffel operation is a comparatively simple operation, not dangerous to life, and, in the opinion of orthopedic surgeons, a distinct advance in the treatment of this condition.

It may be said the benefit derived from all of these measures depends almost entirely on the mentality of the child. I am glad indeed that Dr. Adson brought this point out in connection with the new procedure he speaks of. Given the child with no mentality or poor mentality none of these operations can be expected to be followed by brilliant results. On the other hand, given a child with a good or brilliant mentality (and there are such afflicted with one or the other forms of spastic paralysis of childhood), then we may look with confidence for considerable improvement as a result of operative interference, be it by "The Australian Method" or be it by one of the methods just mentioned.

DR. R. E. FARR (Minneapolis): I wish to congratulate Dr. Adson on his presentation of this subject. I do not feel that there is any great danger of surgeons attempting to do unnecessary operations in this field. Many of these people cannot be improved and Dr. Royal has laid down very definite rules. I saw Dr. Royal examine a number of cases in Chicago and of these he only picked out one as suitable for operation. According to his reports he has had very good success where the operation was indicated. I saw him operate upon a child, doing a lumbar sympathectomy, and he made the exposure very quickly and with no difficulty. I believe the intraperitoneal route may become the most satisfactory in the case of adults. The mental cases that Dr. Jones mentions are not likely to be confused with those where Hunter and Royal have recommended operation. However, the mental condition of the patient will have a good deal to do with subsequent training of the muscles.

AGRILIN NOT ACCEPTED FOR N. N. R.

Agrilin is the uninformative name under which Lehn and Fink, Inc., New York, market a mixture of liquid petrolatum and agar. The preparation is stated to contain 38.6 per cent of liquid petrolatum, and 2.25 per cent of agar. Agrilin is offered to the medical profession and also—through the trade package and newspaper advertisements—to the public. The Council on Pharmacy and Chemistry found Agrilin unacceptable for New and Non-official Remedies because: (1) the name is not descriptive of its composition; (2) it is marketed with claims that are unwarranted and misleading, and (3) it is advertised directly and indirectly to the public and thus furthers the ill-advised use of laxatives.—(*Jour. A. M. A., Mar. 14, 1925, p. 837.*)

TYPHOID VACCINE

The typhoid vaccine now in general use is usually made from a type of organism of low virulence, properly sterilized by heat and containing preservatives, and is administered in doses of three injections, seven days apart. Immunity apparently appears about the end of the first week after the first or second injection. The blood serum of the vaccinated person has then acquired immunizing properties. These properties increase and may reach their maximum shortly after the third injection. It seems to be agreed that this immunity, once acquired, may last for several years; but there is no absolute certainty that a person immunized may not be subsequently infected during this period and typhoid fever produced.—(*Jour. A. M. A., Mar. 21, 1925, p. 916.*)

VISUAL FIELD CHANGES IN NORMAL PREGNANCY*

WILLIAM R. MURRAY, M.D., F.A.C.S.

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Minneapolis

Defects in the visual fields in normal pregnancy have been recognized for many years. The frequency of this limitation of the fields and the cause for the field changes have not been recognized until recently.

A review of the literature shows a number of references to visual field changes occurring during uncomplicated pregnancy. In 1903, Bellinzona and Tridonani¹ published the results of their studies in regard to modifications in the visual fields in pregnant subjects. Twenty-four patients were observed, but no case reports were given. They concluded: (a) that bilateral limitation of the visual fields occurs during pregnancy; (b) this limitation does not consist in a uniform and concentric restriction, but in a hemilateral restriction, namely in a slight beginning hemianopia and a heteronymous hemianopia; (c) this condition is more marked in primipara than in multipara and grows worse with advancing pregnancy; (d) the restriction of the visual field is concentric for the various colors; (e) visual acuity is usually preserved. The authors assume that since there is nervous asthenia in normal pregnancy, there is also optic asthenia, and since there is decreased excitation to reflex, so there is diminished extension of the visual fields; and they imply that the observations made resemble latent hysteria since normal visual acuity was preserved.

In 1910, Forti² verified the findings of Bellinzona and Tridonani by examining the visual fields in normal pregnancy and concluded: (a) that the restriction of the visual fields during pregnancy is less marked in both nasal fields and more marked in the two temporal fields; (b) there is no degree of difference between the restriction of the right and left visual fields; (c) restriction is greater in primipara than in multipara, but it cannot be said to grow worse in advancing pregnancy; (d) the restriction in the visual fields for color is non-concentric because the color areas overlap and

*Thesis read at the Minnesota Academy of Medicine, November, 1924.

cross one another; (e) visual acuity and accommodation are normal. Forti gives no case reports or detailed optic findings; no data on number of patients examined, nor months of pregnancy.

Graef,³ in 1922, writing on eye conditions in pregnancy, refers to a narrowing of the visual fields and attributes the field changes to emotional influences of pregnancy.

Finlay,⁴ in 1922, examined the visual fields in thirty-one cases of normal pregnancy and found that in only nine cases could the visual fields be considered normal. He concluded that the normal hypertrophy of the pituitary gland in pregnancy induces compression of the chiasm manifesting itself by bitemporal contraction of the fields of vision. Changes in the color fields were mentioned only in one case, in which there was a reversal of the fields for blue and red.

Carvill,⁵ in 1923, examined 100 pregnant subjects whose blood tests, urinalyses, ophthalmoscopic examinations and visual acuity were normal, and found that, of the 100 cases, twelve had normal fields, three weeks before parturition and the remaining eighty-eight cases showed varying degrees of bitemporal contraction of the visual fields. The fields for white were taken both before and after confinement and the postpartum fields showed a return to normal in a very large percentage of cases.

In 1924, Löhlein⁶ studied the visual fields in normal pregnancy and found a bitemporal hemianopsia present in 80 per cent of his cases. He states that only exceptionally does contraction of the fields appear earlier than four weeks antepartum and that, as a rule, it disappears completely in a short time.

These changes in the visual fields, which have been noted by a number of observers, have recently been attributed to the anatomical relationship of the hypophysis cerebri to the optic chiasm, and to the pressure to which the optic chiasm is subjected by the enlargement of the hypophysis which occurs during pregnancy. That there is a normal hypertrophy of the pituitary gland during pregnancy has been demonstrated by a number of observers and especially by Erdheim and Stumme,⁷ who published the results of their investigations in regard to the relative weight and size of the hypophysis cerebri in pregnant women, as compared with

non-pregnant subjects, and found the average weight in primipara, a few days after normal parturition, to be .847 grams and the average weight in multipara to be .865 grams, as compared with an average of .618 grams in multipara of the same ages. They also give the average size and weight of the hypophysis in multipara in definite periods of pregnancy and show, in a similar manner, the process of retrogression of the hypertrophied hypophysis at stated periods following parturition. Their results, based on a study of 111 cases, show that the hypertrophy of the pituitary gland begins between the first and third months of pregnancy;

ERDHEIM AND STUMME 1909

Weight and dimensions of hypophysis during and after pregnancy.

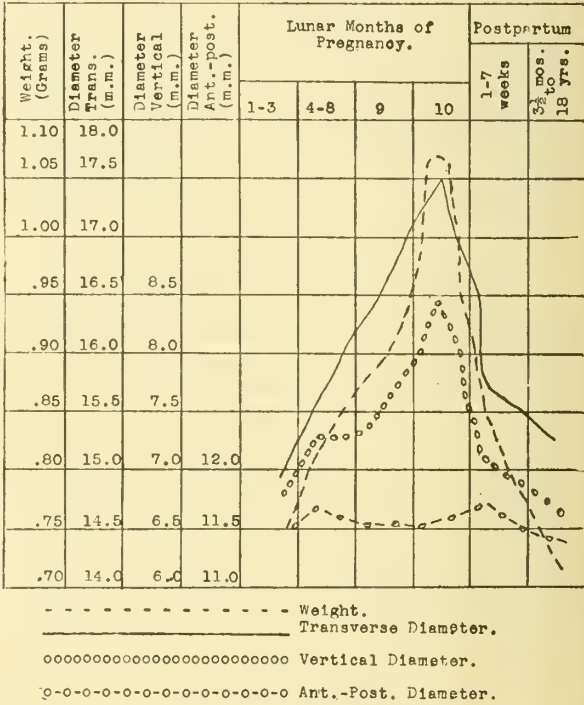


Figure 1

gradually increases in weight through the tenth lunar month, when it attains an average weight of 1.05 grams, and following parturition it decreases in weight rather rapidly during the first eight weeks. The authors also show the changes in dimensions of the gland in the transverse and vertical diameters during the same periods of time.

If, as seems probable, the changes in the visual fields during normal pregnancy are due to a tem-

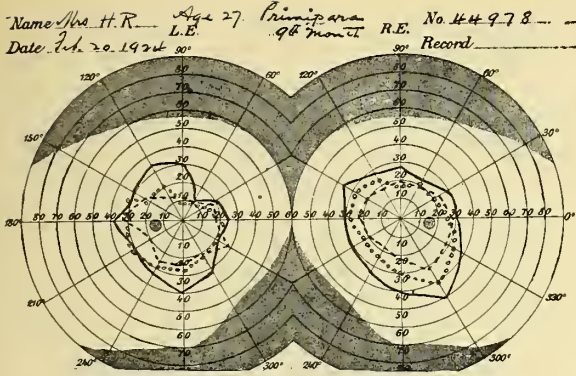


Figure 2

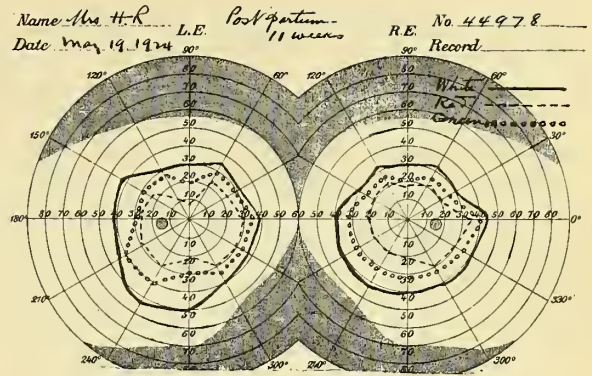


Figure 3

porary functional activity and hypertrophy of the pituitary gland, we may expect to find such changes as may be caused by pressure of the enlarged gland upon the crossed and uncrossed nerve fibers at the optic chiasm. There is a definite relation of the position of the nerve fibers in the chiasm to the different quadrants of the retina. The nerve fibers of the under surface of the chiasm are associated with the inferior portions of the retina; the fibers of the upper surface of the chiasm are associated with the superior retina; the outer or uncrossed fibers proceed from the temporal halves of the retina and the middle or crossed fibers proceed from the nasal sides of the retina.

It is to be expected then that, in addition to the bitemporal defects in the fields caused by pressure on the central portion of the chiasm with its crossed fibers, we will find numerous other field changes due to unequal pressure on portions of the chiasm by the hypertrophied anterior lobe of the hypophysis.

The material on which the present report is

based was obtained from a study of the visual fields of twenty cases of normal pregnancy. In all cases, visual acuity was normal; ophthalmoscopic examinations were negative; physical examination, blood pressures, blood tests and urinalyses were negative; and there were neither subjective symptoms nor objective findings that indicated a toxemia. The visual fields for white and colors were carefully taken by my associate, Dr. W. H. Howard, in good daylight, using a standard perimeter with a radius of 33 cm. and a 5 mm. disk. The fields were charted at intervals of 15° and the central fields were re-examined with a Peters campimeter to determine the presence or absence of scotomata.

In every eye examined, there was a moderate or marked limitation of the field for white and colors; the character of the field changes varied greatly, but in all cases the greatest defect was on the temporal side. In a considerable proportion of cases there were marked sector defects for both white and colors and in some fields conspicuous altitudinal defects were present. In only one case



Figure 4

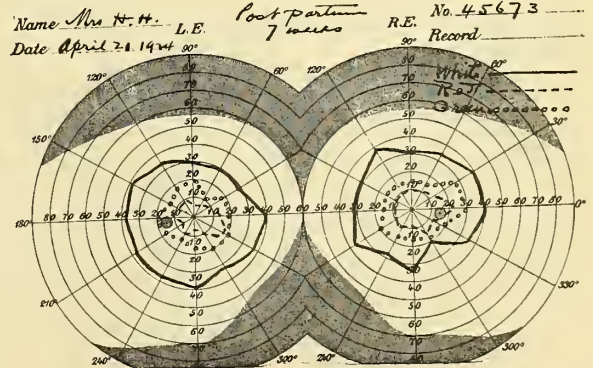


Figure 5

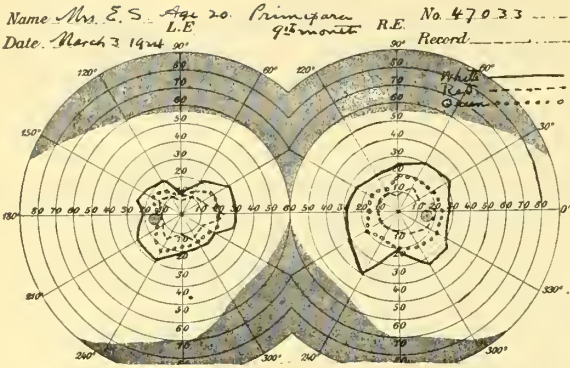


Figure 6

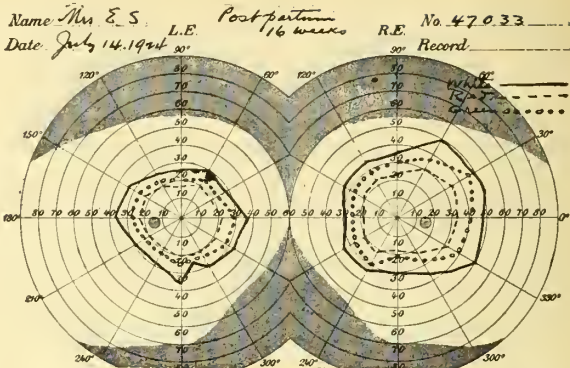


Figure 7

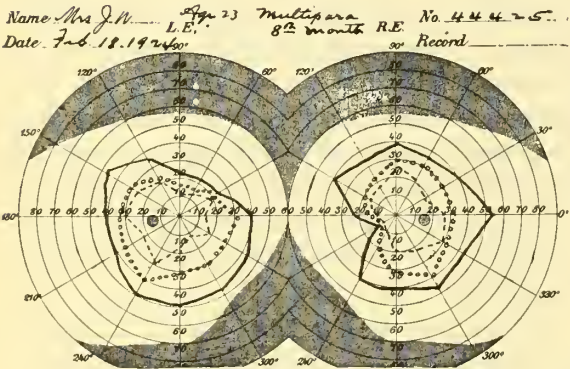


Figure 8

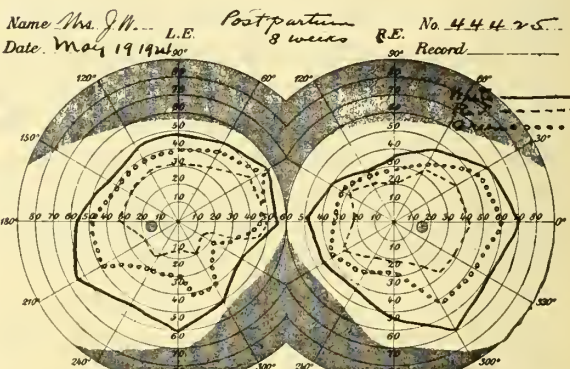


Figure 9

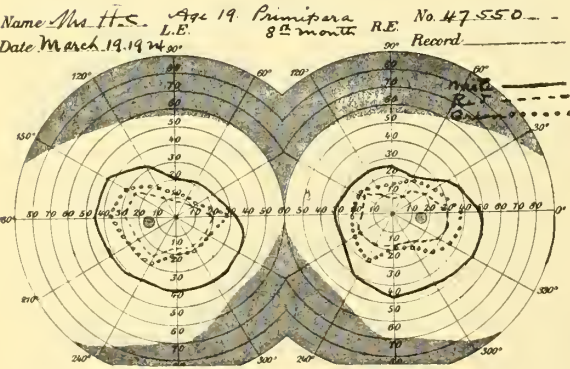


Figure 10

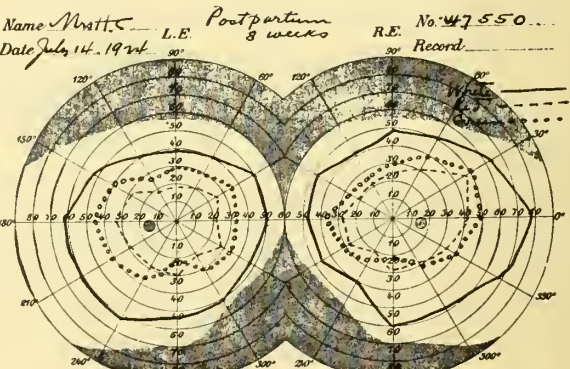


Figure 11

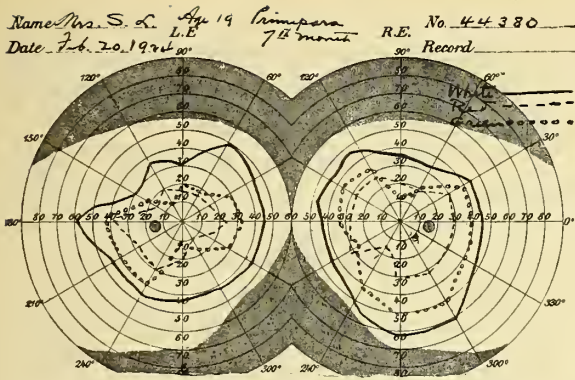


Figure 12

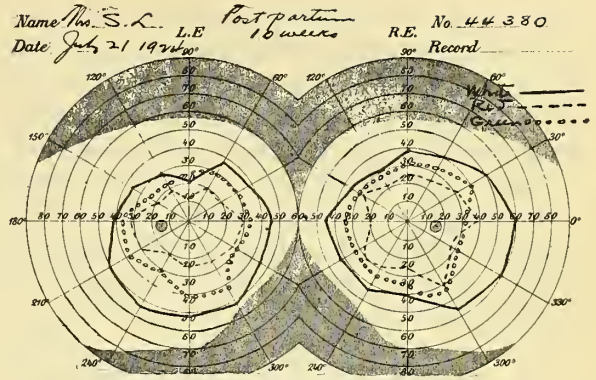


Figure 13

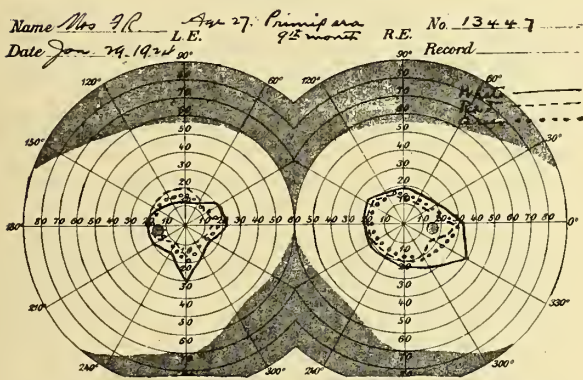


Figure 14

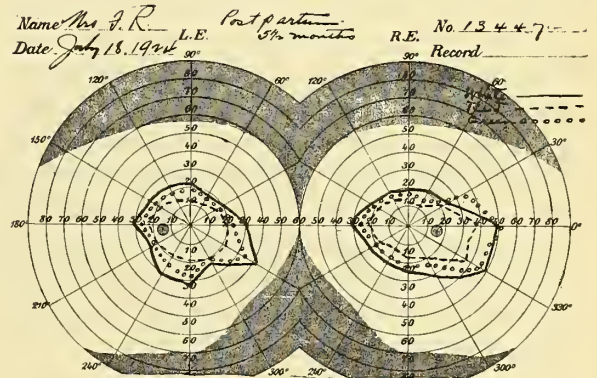


Figure 15

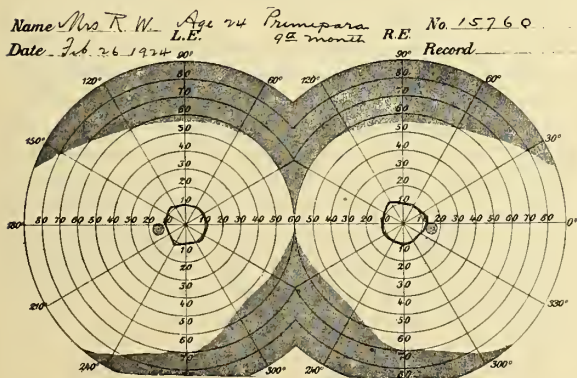


Figure 16



Figure 17

could a scotoma be demonstrated and in that case it took the form of an enlargement of the blind spot in one eye only. In three of the forty eyes examined, the field for white was contracted in all meridians to the ten degree circle. The color fields are particularly interesting in that they show frequent reversals or interlacing of the fields for red and green and two cases show the field for colors to be definitely outside of the white in a portion of the field.

TWENTY PATIENTS - AVERAGE VISUAL FIELD FOR WHITE AS COMPARED WITH NORMAL

	Normal	Average	Maximum	Minimum
Superior	45	23	40	10
Temporal	90	32	58	10
Inferior	70	29	60	8
Nasal	50	29	45	10

Figure 18

In eight of the cases examined, postpartum fields were taken from seven to twenty-two weeks following parturition. In none of these cases had the white and color fields returned entirely to normal and in a large proportion of the cases, the fields still showed considerable limitation. Insofar as our experience is concerned, it is uncertain as to the time, following parturition, that the visual fields become normal.

SUMMARY

1. Contraction of the visual fields occurs during the later months of normal pregnancy and is most marked on the temporal side.
2. The degree of contraction varies from a moderate or slight temporal contraction to one in which the entire periphery of the form field may lie within ten degrees of the point of fixation.
3. In some cases, marked sector defects occur in the periphery of the white and color fields.
4. The color fields show a reversal or interlacing in a very large proportion of cases.
5. Following parturition, the visual fields slowly return to normal and some cases show marked limitation of the fields as late as twenty-two weeks postpartum. Further observations are necessary to determine the average time at which the fields for white and colors regain their normal size.

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LOESER'S INTRAVENOUS SOLUTION OF CALCIUM CHLORID NOT ACCEPTED FOR N. N. R.

In the advertising of the New York Intravenous Laboratory, Loeser's Intravenous Solution of Calcium Chlorid is proposed for use especially in intestinal tuberculosis and tetany. In neither condition are the indications so urgent that the intravenous method is the only or the best method of introducing calcium. The oral administration is generally to be preferred. But the manufacturers make the astounding statement that "Neither calcium nor guaiacol is adapted to oral administration." The Council on Pharmacy and Chemistry found Loeser's Intravenous Solution of Calcium Chlorid inadmissible to New and Non-official Remedies because the advertising implies that the intravenous method is generally the method of choice for the administration of calcium and that calcium is not adapted to oral administration; these claims were held misleading and unwarranted.—(*Jour. A. M. A.*, March 21, 1925, p. 914.)

POLLANTIN NOT ACCEPTED FOR N. N. R.

Pollantin Liquid, Pollantin Ointment and Pollantin Powder are hay-fever "remedies," manufactured in Germany and marketed in this country by Fritzsche Bros., Inc., New York. According to the advertising, it is prepared from the serum of horses inoculated with "the pollens of various species of ragweed and goldenrod, and of graminæ, such as rye, Indian corn, meadow foxtail, timothy grass, etc.," and is suitable for all forms of hay-fever. An enormous amount of work has been published controverting the claimed value of this serum. The principle on which Pollantin was founded has been found to be unsound, and there is no acceptable evidence to show that hay-fever is due to a toxin in pollen. The Council on Pharmacy and Chemistry found Pollantin Liquid, Pollantin Ointment and Pollantin Powder inadmissible to New and Non-official Remedies because the claims for their value are unfounded and they appear to be unscientific and useless articles. (*Journal A. M. A.*, Nov. 8, 1924, p. 1526.)

THE HORMONE OF THE PARATHYROID GLAND—CHANGES IN THE BLOOD SERUM CALCIUM OF THYROPARATHYROIDECTOMIZED DOGS MODIFIED BY THE BOVINE HYDROCHLORIC X

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The results following the use of the Hydrochloric X of the bovine parathyroid, as already reported by the writer, demonstrated that it relieved artificial tetany in dogs. Suspecting that the tetany in dogs, following thyroparathyroidectomy, was due to a lowering of the blood calcium, as a lowering of the blood calcium is known to occur following the removal of the parathyroids in dogs, the writer decided to determine quantitative effect of the original Hydrochloric X on the blood calcium when injected. In order to assure himself that the dogs treated did not have aberrant parathyroids, specimens of blood were secured from the jugular vein before operation. The dogs reported in this article were starved for sixteen hours previous to operation.

Approximately eighteen hours following the operation another specimen of blood was drawn. It was found that a very noticeable drop in the blood serum calcium occurred following the removal of the parathyroids. Immediately following the securing of the second blood specimen for calcium determination, the original Hydrochloric X (5 c.c.) was injected intramuscularly. Six hours later another blood specimen was obtained, followed immediately by another intramuscular injection of the original Hydrochloric X (5 c.c.). Titration of this blood specimen revealed a rise in the blood serum calcium approximating that before operation.

In order to hasten the action and to determine whether, or not, a greater and more rapid rise in

the blood serum calcium might occur with the use of a concentration, the original Hydrochloric X was treated with a sodium hydroxide solution until the maximum precipitation occurred, when the precipitate was removed by filtration and the filtrate concentrated by evaporation to one-tenth of the original volume of the Hydrochloric X.

The next morning, approximately sixteen hours after drawing the third blood sample for titration, another amount was secured and immediately followed by the modified Hydrochloric X (5 c.c.), equivalent to 50 c.c. of the original Hydrochloric X, as a subcutaneous injection. Titrations of this fourth series of blood specimens revealed a calcium content in the blood of three of the dogs above normal and the blood of the subnormal dog approaching normal. About seven hours following the subcutaneous injection of the modified Hydrochloric X, blood specimens were again secured and the calcium content of all four found to be well above normal, ranging from 14.3 mg. to 15.7 mg. per 100 c.c. Sixteen hours later, blood was again drawn and the calcium contents found to range from 15.7 mg. to 19.9 mg. per 100 c.c.

On the fourth day, two blood specimens were secured—seven and one-half hours apart. These were the seventh and eighth titrations. In the seventh series, the blood serum calcium was found to range from 13.8 mg. to 20.08 mg. per 100 c.c., Dog No. 3 having the highest calcium content.* In all of the dogs, except Dog No. 3, the calcium curve was on its downward course. The eighth titration revealed all bloods showing a decrease, the calcium content ranging from 11.3 mg. to 18.4 mg. per 100 c.c. of blood serum.

The reports of the dogs, with a table showing the calcium content of the blood specimens at each successive titration, follows:

Dog No. 1

(1st Day):

Short haired young adult yellow female cur (nulliparous), weight 14 kg., was fasted for 16 hours before operation.

1:55 p.m. Drew 10 c.c. blood from jugular.

1:57 p.m. Hypo. morph. sulph. gr. 1 and atropine gr. 1/100.

3:30 to 4:00 p.m. Complete thyroparathyroidectomy. Preserved glands in formaldehyde for serial sectioning.

(2nd Day):

10:10 a.m. 10 c.c. blood drawn.

10:12 a.m. 5 c.c. HCl X intramuscular.

*Note: No. 3—young dog.

The Hydrochloric X

Fresh bovine parathyroid glands (freed from fat as much as possible, without removing parts of the gland) finely divided.....30 grammes
Pure distilled water495 c.c.
Concentrated hydrochloric acid (C. P.)..... 5 c.c.
(The Hydrochloric X of the Bovine Parathyroid and Its Phosphotungstic Acid Precipitate.—Hanson—The Military Surgeon for January, 1924.)

This is boiled for two hours, removing much of the insoluble fats by skimming with a glass ladle. At the end of two hours it is allowed to cool, when more of the fat separates out and solidifies. It is then filtered through gauze and fine mesh filter paper. It is then made up to 500 c.c. with pure distilled water. 5 c.c. of the Hydrochloric X contains the active principle equivalent to 0.3 gramme of the fresh gland. The entire process is carried through in glass containers.

- 4:15 p. m. 10 c.c. blood drawn.
 4:17 p. m. 5 c.c. HCl X intramuscular.
 (3rd Day):
 8:40 a. m. 10 c.c. blood drawn.
 8:42 a. m. 5 c.c. s.c. of partly neutralized, fil. and conc.
 HCl X 10 equivalent to 50 c.c. HCl X.
 No symptoms of tetany.
 3:30 p. m. 10 c.c. blood drawn.
 (4th Day):
 8:45 a. m. 10 c.c. blood drawn.
 4:10 p. m. 10 c.c. blood drawn.
 (5th Day):
 8:30 a. m. 10 c.c. blood drawn.

Dog No. 2

- (1st Day):
 White and brown young pariparous adult female mongrel fox terrier, weight 10 kg., was fasted for 16 hours before operation.
 2:00 p. m. 10 c.c. blood drawn.
 2:02 p. m. Morph. sulph. gr. 1 and atropine sulph. gr. 1/100.
 4:00 to 4:20 p. m. Complete thyroparathyroidectomy.
 Glands preserved in formaldehyde for serial sectioning.
 (2nd Day):
 10:25 a. m. 10 c.c. blood drawn.
 10:27 a. m. 5 c.c. HCl X intramuscular.
 4:19 p. m. 10 c.c. blood drawn.
 4:21 p. m. 5 c.c. HCl X intramuscular.
 (3rd Day):
 8:45 a. m. 10 c.c. blood drawn.
 8:47 a. m. 5 c.c. Modified HCl X s.c. No symptoms of tetany.
 3:35 p. m. 10 c.c. blood drawn.
 (4th Day):
 8:55 a. m. 10 c.c. blood drawn.
 4:12 p. m. 10 c.c. blood drawn.
 (5th Day):
 8:35 a. m. 10 c.c. blood drawn.

Dog No. 3

- (1st Day):
 White and brown nulliparous young adult female mongrel, weight 11 kg., was fasted for 16 hours before operation.
 1:05 p. m. 10 c.c. blood drawn.
 1:07 p. m. Morph. sulph. gr. 1 and atropine sulph. gr. 1/100 s.c.
 2:10 to 2:30 p. m. Complete thyroparathyroidectomy.
 Glands preserved in formaldehyde for serial sectioning.
 (2nd Day):
 9:05 a. m. 10 c.c. blood drawn.
 9:07 a. m. 5 c.c. HCl X intramuscular.
 3:42 p. m. 10 c.c. blood drawn.
 3:44 p. m. 5 c.c. HCl X intramuscular. No symptoms of tetany.
 (3rd Day):
 8:50 a. m. 10 c.c. blood drawn.
 8:52 a. m. 5 c.c. Modified HCl X s.c.
 4:16 p. m. 10 c.c. blood drawn.

- (4th Day):
 8:45 a. m. 10 c.c. blood drawn.
 4:15 p. m. 10 c.c. blood drawn.

Dog No. 4

- (1st Day):
 White, black and brown nulliparous young adult female fox terrier, weight 9 kg., was fasted 16 hours before operation.
 1:10 p. m. 10 c.c. blood drawn.
 1:12 p. m. Morph. sulph. gr. 1 and atropine sulph. gr. 1/100 s.c.
 2:40 to 3:00 p. m. Complete thyroparathyroidectomy.
 Glands preserved in formaldehyde for serial sectioning.
 (2nd Day):
 9:10 a. m. 10 c.c. blood drawn.
 9:12 a. m. 5 c.c. HCl X intramuscular.
 3:46 p. m. 10 c.c. blood drawn.
 3:48 p. m. 5 c.c. HCl X intramuscular. No symptoms of tetany.
 (3rd Day):
 9:00 a. m. 10 c.c. blood drawn.
 9:02 a. m. 5 c.c. Modified HCl X s.c.
 4:18 p. m. 10 c.c. blood drawn.
 (4th Day):
 8:50 a. m. 10 c.c. blood drawn.
 4:20 p. m. 10 c.c. blood drawn.

Blood Serum Calcium Milligrams per 100 c.c.
 at each successive titration.

Hours	0	18	24	40	48	64	72	88	112	136
Dog No. 1.	11.0	9.3	11.0	13.5	15.4	17.2	16.2	15.1	14.4	13.3
Dog No. 2.	12.3	8.6	10.0	11.2	14.3	15.7	13.8	11.3	9.0	8.7
Dog No. 3.	11.5	8.8	11.4	14.4	15.7	19.9	20.08	18.4	12.6	...
Dog No. 4.	11.9	8.6	11.2	13.5	15.6	17.0	15.2	10.2	9.2	...

These dogs, with the exception of the sixteen-hour period of starvation preceding the operation and the remainder of the day following the operation, were fed on the usual dog food of ground meat. No signs of tetany occurred and the dogs appeared normal until the calcium level reached was low.

The Kramer-Tisdale method was employed in making the calcium determinations. The potassium permanganate solution was prepared in accordance with the directions given by J. A. Halverson and O. Bergeim.* Two titrations were made on each sample of blood drawn, with the exception of the second titration series in Dog No. 4, because of the impossibility of securing sufficient serum for two titrations. All of the titrations checked within 0.02 c.c. N/100 potassium permanganate titrating solution. The correction

*Journal of Industrial and Engineering Chemistry, 1918, x, 119.

determined by the blank determination was 0.02.

In Dog No. 3, in which the calcium content reached the highest level, there was an increase of 74.6 per cent above normal and an increase above the level found following thyroparathyroidectomy of over 128 per cent. In Dog No. 2, in which the least rise in the calcium content was found, the highest increase above normal was 27.6 per cent, while the increase above the lower level reached following thyroparathyroidectomy was 82.5 per cent.

In this experiment a rise in blood calcium above the content normal for each dog, the percentage increase ranged from 27.6 to 74.6 per cent, while the percentage of increase above the lower level reached following thyroparathyroidectomy ranged from 82.5 to 128 per cent.

The writer calls attention to the fact that his Hydrochloric X is prepared from strictly fresh parathyroid glands of cattle, and, if these instructions are faithfully followed, and the X is concentrated as the Modified Hydrochloric X, described in this article, he feels confident that honest investigators may easily and definitely check his results.

CONCLUSION

An acid extract, as the Hydrochloric X, or the Modified Hydrochloric X, contains that parathyroid element which raises the calcium content of the blood as shown by this experiment. This is most conclusive in the mind of the writer, as this increase of blood serum calcium has been secured in thyroparathyroidectomized dogs on a meat diet. It also tends to show that tetany is probably due to a hypocalcemia.

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ACTIVE IMMUNITY IN SCARLET FEVER*

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The serious ravages of scarlet fever among children and the rather recent developments in active immunization against this disease have been topics of unusual interest within the past year.

Following the investigations of Dick,¹ Dochez,² Tunnicliff,³ Gordon⁴ and others, the results of which were, in short, that the cause of scarlet fever is the scarlatinal streptococcus and that this organism is a definite biologic type, a skin reaction to the toxin produced from the organism was announced by Drs. Dick in January, 1924. By injecting 0.1 to 0.2 c.c. of a diluted toxic filtrate intradermally in individuals who gave a negative history of scarlet fever they produced local reactions, whereas, in those previously infected by scarlet fever there were no reactions. Zingher⁵ made a practical study of this test in a large group of individuals and by injecting larger and more concentrated doses of the toxin into a number of children who were susceptible found that approximately 61 per cent of them were immune as determined by a re-test at the end of two months. He used a series of three injections at weekly intervals of one hundred, then two hundred fifty and again two hundred and fifty "skin-test doses" for children under twelve years of age.

Through the courtesy of Dr. Zingher, who kindly furnished me with the toxin as prepared by the Dicks, I undertook a study of its value: (1) as an index of immunity or susceptibility to scarlet fever; (2) as an aid in diagnosis of doubtful cases; (3) as an agent in producing active immunity to the disease.

THE DICK TEST AS AN INDEX OF IMMUNITY

In attempting a study of this phase our first consideration was the reliability of the product to be used. It has been emphatically stated by those who have done pioneer work in this field that so far we have only a comparative method of standardizing the toxin. The toxin used by Zingher has been standardized by noting, in different dilutions,

*Presented before the Lymanhurst staff March 24, 1925.

its local effect on the forearm of a Dick-positive individual as compared with the effect of a toxin which is kept on hand. The variable strength of some preparations for the test I believe may lead to error, because one which is too strong will give positive reactions in some persons actually immune and conversely one which is too weak may give negative reactions in many who are susceptible.

In performing the tests with Zingher's toxin, a dilution of 1-1,500, as suggested by him, was used. A control test of the same preparation, which was first heated in a water bath for one hour, was applied on the opposite forearm. In each case 0.2 c.c. was injected, using the same technic as for the Shick test. In the interpretation of the reactions I used Zingher's scale, i.e.:

TABLE 1

Dick test	Control test
Test Toxin Diluted 1:1000	Test Toxin (1:1000) Heated
contains	to 100 C. for one hour
(a) Toxin	Contains
(b) Various proteins	Various proteins

READING OF REACTIONS IN TWENTY-FOUR HOURS

Positive	++	+	or	±	—
Positive-combined	++	or	+	±	or ++
Negative	—				—
Negative-pseudo ...	+	1	2 or 3	+	1 2 or 3

++Maximum reaction. Intense redness and local induration.

+Marked redness with slight or no local induration.

±Varying degrees of redness, from a moderate red to a pink. No induration.

+±Small area of faint redness. No induration. This reaction is classified with the negative reactions.

The results of 422 tests are included in this study and, grouped chronologically, show the percentage susceptibility for different ages (Table 2).

TABLE 2

A. (Birth to one year).....	30 %	Positive
B. (One to two years).....	62.5%	Positive
C. (Two to three years).....	72.7%	Positive
D. (Three to four years).....	66.6%	Positive
E. (Four to five years).....	50 %	Positive
F. (Five to ten years).....	40.9%	Positive
G. (Ten to fifteen years).....	34.5%	Positive
H. (Fifteen to twenty years).....	25 %	Positive
I. (Over twenty years).....	23.4%	Positive

The rather small percentage of positives in group A is probably accounted for by the fact that the majority in this group were new-born infants. The figures otherwise are slightly higher than some of those previously published although the curve of

all the figures corresponds quite closely to what we expect as the incidence of susceptibility to scarlet fever at various ages.

Since the test is read at the end of twenty-four hours we have a comparatively rapid means of determining the possibility of cross-infection in a patient's immediate environment. In this study it was hoped that we might utilize the scarlet fever antitoxin for passive immunity in positive cases that had been exposed. Inability to secure a suitable preparation however precluded this possibility. Recent work reported in the literature indicates that we may soon have a preparation which will permit further progress in this direction.

A small number of "exposure" cases were followed after the Dick test had been applied and they are briefly summarized in Table 3.

TABLE 3

24 Exposed Individuals	Contracted Disease	Did Not Contract Disease
9 Dick Positive	2+ (1?)	6
15 Dick Negative	0	15

The questionable case listed is that of a nurse who two months ago was Dick-positive. At that time she was caring for a scarlet fever case and immediately afterward had a rather badly infected finger and sore throat. She is now Dick-negative.

Aside from these definitely exposed cases none of the negatives have to date contracted the disease. Though the number of cases is rather limited the study thus far would suggest that the test is a reliable one as an index of immunity.

A rather interesting observation was made on five mothers and their newborn babies (Table 4).

TABLE 4

Mrs. M.—No history of scarlet fever	+	Baby —
Mrs. J.—No history of scarlet fever	+	Baby —
Mrs. L.—No history of scarlet fever	+	Baby —
Mrs. G.—No history of scarlet fever	—	Baby —
Mrs. T.—Scarlet fever at eight years	—	Baby —

According to test there were antitoxic antibodies present in all the babies whereas in two of the mothers they were absent.

DIAGNOSTIC AID OF THE DICK TEST

In this study clinical cases of scarlet fever were selected. Tests were performed as soon after the onset as possible and thereafter at varying intervals. These are included in Table 5.

TABLE 5

Case	Days Ill	Test	Days Ill	Test	Days Ill	Test
I.	3	+	10	—		
II.	6	—				
III.	2	+	9	—		
IV.	1	+	5	+	17	—
V.	3	+	9	+	22	+
VI.	11	—	43	—		
VII.	2	+	7	—		
VIII.	4	+	11	—	18	—

In this group all the cases with the exception of Case I became negative between the fifth and seventh days. Case V had a rather faint but definitely punctate erythema, associated with a mild constitutional reaction and slight congestion of the pharynx. There was no desquamation.

Case VI illustrates the value of the test from a diagnostic point of view probably better than any of the others.

J. R., aged 8, white, male, four days previous to admission complained of sore throat, high fever, and severe epistaxis. Rather profuse hemorrhage from the nose during the next three days was checked by cautery but recurred shortly after. At this time the child also had a vaccination "take." One year previous to the present illness he had a secondary anemia resulting from hemorrhage from nasal varices. There was no history of scarlet fever.

When first seen, at the time of admission, unusually prominent papillæ of the tongue were noted. The child was extremely pale and there were typical purpuric areas over the trunk and extremities, with a Hgb. of 7% (Dare), Rbc. 810,000, and Wbc. 8,800. The differential was normal. Smear showed severe form of secondary anemia. The bleeding time was 4 minutes, and the coagulation time 2 minutes, with a rather non-retractile clot. Blood platelets 150,000. Transfusion and nasal cautery, calcium and opiates were used and the bleeding stopped. Six days after admission there was a generalized coarse desquamation of the skin and a Dick test at this time was negative. The boy was transfused six times and after a stay in the hospital of eight weeks was discharged. At the present time his hemoglobin is 57%, he feels and looks well and is still Dick negative.

Although no eruption was ever noted, the above case no doubt represents a true scarlet fever infection and I believe the Dick test has a definite place as an aid in diagnosis where there is any question whatsoever of scarlet.

ACTIVE IMMUNIZATION

To induce active immunity in susceptible individuals the same toxin was used as had previously been used for the Dick test except that it was more concentrated (Dilution 1-20). The dilutions (in saline) were so prepared that 0.2 c.c. (dose No. 1)

represented 100 skin test doses, 0.5 c.c. (dose No. 2) represented 250 skin test doses, and 1 c.c. (dose No. 3) represented 500 skin test doses. Later, doses of 250, 500 and 1,000 were used.

Injections were given at intervals of seven days, beginning with .2 c.c., then .5 c.c. and finally 1 c.c.

In eighty-six cases inoculated all showed a local reaction, consisting of redness and swelling of the tissues. The area affected varied from 4 cm. in most cases to an involvement of the entire upper arm in a few. Constitutional symptoms were noted in 47 cases. These consisted of slight fever, general malaise, headache and nausea.

In four cases a faint rash, sore throat and moderate elevation of temperature were observed. In no case did the symptoms persist longer than thirty-six hours. Fifty-two of the cases have been re-tested and the results are tabulated below.

TABLE 6

Case No.	Interval between last injection and first re-test	Result	Second re-test	Result
1.	11 weeks	Positive		
2.	12 weeks	Negative		
3.	12 weeks	Negative		
4.	9 weeks	Negative		
5.	9 weeks	Positive sl.		
6.	13 weeks	Positive		
7.	12 weeks	Negative		
8.	16 weeks	+ — — (Neg.)		
9.	9 weeks	Negative		
10.	14 weeks	Negative		
11.	12 weeks	Negative		
12.	12 weeks	Positive		
13.	6 weeks	Negative		
14.	6 weeks	.7x1.0 Ind. and raised Control 0.5x0.7. Not ind. or raised.		
15 to 48	7-8 weeks	Negative		
49.	7-8 weeks	Positive		
50.	7-8 weeks	Positive (?)	8 weeks	Neg.
51.	5 weeks	Negative	15 weeks	Post.
52.	7 weeks	Negative	17 weeks	Post.
53.	13 weeks	Negative		
54.	10 weeks	Positive		

Of the fifty-four cases retested to date forty-six, or 80.5 per cent, were immune according to test after intervals of from five to sixteen weeks. Two cases have apparently lost their immunity toward the end of fifteen and seventeen weeks respectively.

The high percentage of immune cases at such a comparatively short interval is unusual. Thirty of the cases, immunized by one individual, were all negative on re-test and this result brought up the question of whether the test material had possibly been improperly diluted. These cases are now being repeated.

In conclusion I would say, from the results of the work so far, that: (1) the Dick test seems to be a reliable indicator of immunity or susceptibility to scarlet fever; (2) it has a definite place as a diagnostic aid in questionable cases of scarlet fever; (3) the toxin seems to render individuals immune for a period of at least ten to fifteen weeks. How much longer the immunity lasts, cannot be said as yet. Two out of fifty-four cases lost it after fifteen and seventeen weeks respectively.

I believe that physicians should keep an open mind and try to avoid prejudice in this question of scarlet fever immunity until more cases have been observed over a reasonable period of time. Until more work has been done to prove or disprove the efficacy of our present or any improved forms of toxin, it is as unfair to condemn it as it is to pronounce it a panacea.

I am indebted to Drs. Huenekens, Moriarity, Stewart, Richdorf, Butzin and Arthur for their co-operation which made this study possible.

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DIATHERMY IN VASCULAR CIRCULATORY DISTURBANCES AND ARTHRITIS*

ALBERT E. FLAGSTAD, M.D.

St. Paul

Diathermy has a definite place in therapeutic medicine. It is our most valuable method of using heat. It is easily applied. It is constant and can be measured.

"Most important, it will heat distant parts; the quantity of heat varies as the resistance of the tissue through which the current passes, the greater the resistance the greater the heat."

Diathermy has a wide application. It is contra-indicated in: (1) undrained pus areas; (2) when there is a danger of hemorrhage.

A great commercial enterprise has come into being. There are those who will almost persuade one to believe that diathermy is a new panacea. We have all heard startling statements; many are true, some are propaganda.

Our experience with diathermy, while recent and limited, has taught us several things. We have used it almost a year, and during this period we have given nine hundred treatments to approximately fifty patients. Most of these treatments have been given by one individual in an attempt to ascertain the true status of converse heat, thus the conclusions in this paper are drawn from personal observation and treatment. We have come to realize that it is not sufficient to purchase a machine. Most important is the selection of cases—knowledge of the apparatus and its proper application. The same rule is applied here as in prescribing any drug. Time is an important factor; it is rarely a single application, but rather repeated applications that benefit. The number and duration of applications vary as to conditions encountered.

In this paper we are concerned especially with the use of diathermy in vascular circulatory disturbances and arthritis. In passing may we say that it is an important adjunct in the treatment of sprains, fractures, bursitis and other bone and joint conditions.

We have used diathermy in several different vascular circulatory disturbances.

*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, Minn., October, 1924.

Arteriosclerosis.—A fair number of middle-aged individuals are seen who complain of painful feet and calves made definitely worse by activity. A few of these patients present the syndrome of intermittent claudication. Examination of the extremities is negative except for varying degrees of sclerosis and cyanosis. Roentgen-ray pictures in the majority of these cases show sclerosis of the posterior and anterior tibial vessels. Several cases briefly cited will illustrate:

CASE I. Mr. E. B., aged 54, was first seen March 31, 1924. He complained of painful feet with feeling of pressure over calves, aggravated by activity.

His illness had extended over a period of several years. He had had a variety of treatments including a course at Hot Springs with no benefit. Since the last of January pain and tenderness were so severe that it was almost impossible for him to wear his shoes or get about. The patient reported, walking with great difficulty, supported by two canes and wearing large overshoes.

Mr. E. B. said he had always been in fair health except for periodic attacks of gout. He stated he was a very heavy smoker and hearty eater.

Physical examination was essentially negative except for moderate sclerosis of the vessels and some distention of the veins of the lower extremity. His feet were mildly pronated and he had a mild cyanosis and redness of the toes. The dorsalis pedis pulse was present in both feet. The roentgen-ray showed sclerosis of anterior and posterior tibial vessels.

The patient stated that he had been given hot baths, baking, electricity, and hot packs with very little benefit. He was given diathermy, combination cuff and water method, to both feet for forty-five minutes. This was followed by massage for ten minutes. After the first treatment the patient reported that he had less pain and walking was much easier. At the end of several weeks he was able to wear shoes, his walking was much improved, and the pain was decidedly less. After five weeks the patient was practically well except for slight tenderness over the left tarsus. In addition to the diathermy the inner edge of both shoes, heel and sole, were thickened one-eighth inch and felt arches were inserted in the shoes. Mr. E. B. was seen recently and stated that his feet felt good and that he was able to go about his daily routine in comfort.

CASE II. Mr. A. M., aged 47, was first seen at our office April 20, 1920. At this time he complained of pain in his legs and feet, aggravated by activity; also of a painful back. His present illness began in 1918. He first noticed numbness and tingling in the left foot, more apparent in the afternoon. During 1919 the right foot became involved. Elastic stockings, he said, seemed to aggravate his trouble. Since the onset, his trouble has progressively become worse until at present it is hard to get about. He admitted a Neisserian infection in 1917. He has a chronic myocarditis and is under the care of an internist. The patient is a very heavy cigar smoker.

Mr. A. M.'s physical examination was negative except for mild sclerosis of the blood vessels, chronic myocarditis,

pendulous abdomen, mild spondylitis, definite interference with the circulation of the lower extremities, cyanosis of both feet, and redness of toes. In April, 1920, alternate hot and cold baths to both feet, forced fluids, and rest were advised. He was given an abdominal and back support.

The patient reported again in June, 1920. This time his back was improved but his feet still troubled him.

In February, 1924, his spine was apparently well. His legs and feet felt worse and he could walk only a very short distance without pain. His physical examination at this time was much the same as in 1920, except that the redness of the toes was more pronounced. Brachial blood pressure at this time was 120/60. Pulsation could be felt over both anterior tibials. The movements of both feet were good, and the arches were apparently normal. Urine examination was negative. Roentgen-ray showed definite sclerosis of posterior and anterior tibial vessels.

In February, 1924, the patient was given diathermy to both feet. A combination cuff and water method was used. This was followed by ten minutes massage. The following day the patient reported that his feet felt the best they had in several years. He was given several more treatments, when he was unexpectedly called home. Upon leaving he said he was very enthusiastic about the transformation in his feet. After the first treatment he had been able to get about without discomfort. He was greatly surprised and satisfied with the results. After returning home he was given a few more treatments by his local physician. March 17, 1924, the patient wrote that he was getting along nicely. On August 29, 1924, he reported that he felt quite well.

Endarteritis Obliterans.—CASE III. Mr. H. D., a Russian Jew, thirty-one years of age, was seen at the office December 7, 1921. He complained at this time of a very painful left foot, especially the great, first, and second toes. The patient stated that he was a recent immigrant, had served seven years in the Russian army, four years of this period in the World War. During the war he suffered from exposure to weather elements, and lack of food and clothing. His present illness began late in 1919. He first noticed tingling and numbness of the left foot, especially upon activity. This has progressively become worse until at present he cannot hold his foot down for any period of time. Several weeks ago he developed a small sore on the medial aspect of the great toe. He states that he cannot sleep at night because the pain is almost continuous and most intense. He has found some relief by elevating his foot when sitting or lying down. The patient was treated in Russia but received no benefit. He has always been in good health except for a Neisserian infection in 1911. He is a very heavy cigarette smoker.

His general physical examination was essentially negative except for evidence of suffering and loss of weight and changes in the left leg. The left leg below the knee is atrophied, foot is cyanotic and cold, first and second toes are deep red, the great toe is ischemic. The blood pressure in the right popliteal space is 120, left imperceptible; right dorsalis pedis pulse present, left not palpable.

Mr. H. D. was given hot packs, fluids were forced, and potassium iodid given for a period of several weeks. At

the end of this time his condition was the same so hospital care was advised. The patient was referred to the Wilder Charity and in January, 1922, he underwent several operations. The great toe nail was first removed and soon after a periarterial sympathectomy of the left femoral artery was done. In conjunction with this patient was given sodium citrate intravenously and various medications were tried. He remained in the hospital for a period of three months, during which time his suffering was quite intense. He was discharged slightly improved.

The patient was again seen in June, 1924. At this time he stated his condition was worse. He could sleep an hour or two at a time, but it was impossible to work or be on his feet longer than several hours. He was advised to try diathermy and was given converse heat, combination cuff and water method, to the left leg and foot. After the first treatment patient reported that he felt better and that he had suffered less pain during the night. He was given daily treatments for a week, time of treatment one hour, tolerance increased to 400 milliamperes. After a week's treatment, the patient walked with decidedly less lameness. He said he was practically free from pain, could sleep all night, and could get about with considerable comfort. He felt the best he had since the onset of his illness. After three more treatments the patient failed to report. After several days he again reported and informed us that he was working all day and as he felt almost as well as ever he thought further treatment unnecessary. However, he had noticed more tingling the last day so he returned for more treatment. He was advised to take at least three months of converse heat. After four more treatments, during which period patient worked nine hours daily, he felt that his trouble was over and told us that he would report again if he had further pain. At the end of the first six treatments the dorsalis pedis, posterior tibial, and popliteal pulsations during treatment were quite marked. The marked tenderness over the great toe disappeared and circulation of the foot approached normal. On his last visit blood pressure of the left dorsalis pedis showed oscillation at 120, pulse faintly heard at 100, diastolic 70. Mr. H. D. on last report was working daily and doing nicely. He felt an occasional twinge of pain.

Raynaud's Disease.—CASE IV. Mr. M. J., aged 43, was first seen at our office January 3, 1921. His complaint at this time was a sore and painful leg as a result of a fracture of the os calcis. In October, 1923, the patient quite suddenly became aware of numbness, tingling and burning of both hands, especially the right, aggravated by exposure to cold. As winter came on his suffering became most intense and it was impossible to expose his hands to cold for any period of time. Examination of the hands at this time showed definite sclerosis of vessels and circulatory disturbance of both hands, especially the right. Hands were cyanotic, the right showed definite blanching and ischemia of the index, second and third fingers. Patient's feet were somewhat cyanotic but dorsalis pedis pulse was present although somewhat sclerotic. Patient was unimproved after several weeks of hot packs, therapeutic lamp and galvanic current. He was then given diathermy, combination cuff and water method, to both hands. After several treatments the patient reported improvement and was

then able to carry on routine work. During the winter of 1923-1924 he was given fourteen diathermy treatments, as a result of which circulation improved, blanching disappeared and patient suffered very little discomfort. In July, 1924, the patient reported that his fingers were apparently normal and he suffered no discomfort. He was asked to report if he should have further trouble.

In our group of circulatory cases we have had two patients who felt that after several treatments improvement was not great enough to warrant continuation; both, however, said they were slightly benefited.

Arthritis.—An extensive survey of converse heat in arthritis is impossible at this time. To facilitate discussion let us divide the arthritides into two general groups, traumatic arthritis and infectious arthritis.

Traumatic Arthritis.—Our results in this group on the whole have been quite satisfactory.

Traumatic Synovitis.—CASE V. Mr. E. B., a pugilist, aged 20, reported May 24, 1924, complaining of a sore and painful second knuckle of the right hand. He sustained an injury to the hand in a fight on April 5, 1924. He participated in several fights after the injury, which increased the pain and swelling, and on several occasions had novocaine injected before he fought, which seemed to aggravate the trouble. The patient was compelled to cancel three fights. He rested a month, during which time he was given hot and cold applications, massage, splinting and electricity, with only slight improvement. Examination of the hand showed swelling and tenderness over the head of the second metacarpal, with fairly marked crepitation, slight fluctuation present, and extreme motions causing pain. A diagnosis was made of traumatic synovitis of the second metacarpal phalangeal joint. During the first week the patient was given five diathermy and massage treatments. At the end of this course of treatments the tenderness, crepitation and fluctuation was diminished. On May 31, a week after his first visit, the patient fought. He reported on June 2d that he had won his fight, favoring his hand some. He was given three more treatments and then fought again, using his hand normally, and had no pain. He was given three more treatments, when he left for an eastern engagement. Upon his return he reported that his hand was as good as ever.

We have had several other traumatic cases that responded to diathermy after other therapeutic measures had been ineffective. Diathermy followed by manipulation and massage is of real value in the treatment of fibrous ankylosis, subsequent to trauma or infection.

Infectious Arthritis.—In eighteen of the twenty cases treated, converse heat has relieved the soreness, stiffness and pain, but in no case has its use resulted in cure. All of these cases have been of long standing; many therapeutic measures had

been tried with indifferent results. All of these patients preferred this type of heat to hot packs or therapeutic lamp. Infectious arthritis of one or two similar joints is easily treated by direct diathermy; the extensive polyarthritides are a bigger problem. We have tried sedative therapy in several of these cases, but the time is too long and often the patient is exhausted before the treatment is completed. Recently we have confined our efforts to the painful joint, and cases in which all joints are actively involved are not given converse heat. We have had several cases of gonorrheal arthritis which have been benefited by diathermy. In chronic infectious arthritis I feel that diathermy is a palliative measure. It will in most cases temporarily relieve soreness, stiffness and pain, and facilitate the absorption of adhesion and increase motion. It is of primal importance to seek the focus of infection and to use all possible means to rid the patient of the infecting organism. It should be used in conjunction with other therapeutic measures. Treatment as a rule is over a considerable period of time.

CONCLUSIONS

Our experience, while very limited, suggests the following:

1. Painful feet and calves in the presence of sclerotic vessels are benefited and probably cured by diathermy.
2. Converse heat should be used in endarteritis obliterans before extensive surgical procedure is attempted or defeat acknowledged.
3. Diathermy has a definite place in the treatment of traumatic arthritis. It diminishes the period of disability and aids the prognosis.
4. Converse heat is a palliative measure in the treatment of infectious arthritis. It is an important adjunct in dealing with this condition.
5. Like all therapeutic measures in medicine, results in diathermy are commensurate to its application. It must be observed with the same respect that is given any drug, and prescribed in the same careful manner. Indifferently or wrongly applied it can do no good.

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DISCUSSION

DR. P. J. BOMAN, Duluth: Diathermy or converse heat unquestionably is a therapeutic measure which warrants our consideration. Medical therapy in the past, and at the present time, has suffered a great deal by two groups of men in the medical profession. In the first place, we have the old conservatives who refuse to accept anything except that which has definitely been established by long years of usage and of known benefit. On the other hand, we have a group of men who enthusiastically take up every form of treatment that is advocated and without any knowledge of the underlying principles or the indications for its use, apply it to any and all conditions. The result is that soon the therapeutic measure is thrown into the discard. There are always some men, though, who look at it from a conservative standpoint—the measures are studied; the underlying principles are known, and from a series of carefully controlled cases results are observed. It is only by this form of study of therapeutic measures that we are going to make progress in the field of therapy.

This is especially true of diathermy and it is not surprising that many of the older men, without experience with the later forms of electrical therapy, should be skeptical. Many have spent a good deal of money in useless apparatus only to find that it did not produce the results that had been promised.

On the other hand, we receive reports daily, and especially so within the last year, which indicate the value of diathermy. At the last meeting of the American Medical Association the interest in diathermy was very evident, as was shown by the papers presented there. The results reported showed that where diathermy was used in the conditions where it is indicated these men have had uniformly good results, as high as 70 to 80 per cent at times.

When Dr. Tuohy returned from Europe two years ago he was convinced that diathermy was a therapeutic measure we could not afford to be without. Since that time in the Duluth Clinic we have used diathermy as an adjunct to other therapeutic measures. We have never used it except in cases where we have had the patient under very careful control. All our work has been done at the hospital. We have used it in all types of cases where we felt that it was indicated, and I can say that our experience, while not, perhaps, showing as marked improvement in cases of the vascular type, as shown by the essayist, has been very satisfactory, and we feel that, in conjunction with other forms of therapy, it is of great value.

It is especially valuable in the traumatic arthritis and acute pains, neuritis, etc. In these conditions we have found it to be of distinct benefit. You will find that there is no form of drug which will produce the relief from pain which you will get by means of diathermy.

In most of those cases where you have severe injuries, with pain, you will not need opiates or analgesics if diathermy is employed.

I think the future will see the application of diathermy in a much wider field than at the present time. I feel that it will become established as one of the therapeutic measures which is of distinct value. If you will realize that diathermy is nothing which is occult or unknown, that it is heat produced within the tissues, and indicated where ever heat is indicated, you will have no misconception with regard to its use.

DR. G. S. WATTAM, Warren: Gentlemen, for a quarter of a century physiotherapy has been called to our attention by most reliable workers in this country, and yet it did not receive recognition until some of our men went over to Germany and found that it had recognition there and was being put to practical use. In speaking as a student of physiotherapy I can make no claim to other than a very superficial knowledge of the subject which Dr. Flagstad has so ably presented today. Diathermy is but one of the many therapeutic measures designated as physiotherapy. Under this heading we have the x-ray. We have also the ultra-violet ray and the alpine light. We have high frequency and we have galvanism. One of our most able students and one who had practiced physiotherapy for many years in Minnesota, said to me the other day, if he had to make his selection as to which of these he would use his choice would be between diathermy and galvanism.

I have little to add, at this time, to what Dr. Flagstad has said, excepting that his paper will be of very much value and benefit to our profession. As he has well said, diathermy is not a cure-all, but it is not without merit, and if given intelligent use and intelligent study, I believe that it will soon be recognized and given an important place in our medical curriculum where it deserves to have a place. Only by giving it recognition and weeding out the good from the bad can its use by charlatans and quacks be avoided. It is up to our medical profession to develop it and accept it, not turn it over to some outsider.

DR. A. U. DESJARDINS, Rochester: Mr. Chairman, I should like to say that during the past twenty-five or thirty years electrotherapy in general has been very much discredited in America, owing largely to the fact that the different modalities of this therapeutic agency were misappropriated and misused by quacks of all sorts and disciples of all the various cults. The result has been that the regular profession has looked askance at all these methods of treatment. During the same period the situation in Europe was quite different. There electrotherapy remained in the hands of highly trained experts, most of whom were at the same time radiologists. The result of this was that the valuable features of electrotherapy were constantly being made use of for the benefit of such patients as required this type of treatment. When the war broke out many American physicians accompanied the American army to France and during their service there had the opportunity to see and to appreciate the value of sound electrotherapy, including, of course, diathermy, and it is since the war that diathermy and electrotherapy in general have again been gradually taken up by the profession. It is to be hoped that those who go into this work will so thoroughly prepare themselves for it that they will be able to carry it on intelligently and not merely take it

up for base commercial reasons. Manufacturers of electrical apparatus are carrying on a far too vigorous propaganda which is unduly and improperly influencing many physicians.

As Dr. Boman has said, diathermy is simply a superior method of delivering heat to the tissues of the body. It is not a supernatural exhalation from Heaven and cannot be expected to accomplish miracles, but whenever heat is indicated, diathermy provides the means of delivering that heat when and where it is needed. It may be given in any intensity; it may be diffused or concentrated as much as may be desirable. The indications for diathermy are restricted to a somewhat limited group of pathologic conditions. It is especially useful in sprained joints; the inflammatory phenomena accompanying fractures; acute simple arthritis; in fact, many forms of acute inflammation in which suppuration is not present; sciatic neuritis; brachial neuritis; acute myositis; gonorrheal epididymitis and orchitis; dysmenorrhea, et cetera. The claim has been made that it is decidedly useful in pneumonia, but this has not been adequately confirmed. Certainly it is symptomatically useful, but it is doubtful if it can have any other effect on the disease than symptomatic relief.

In the more chronic conditions such as that large group of chronic arthritides, many of which are so difficult to treat, diathermy sometimes will yield striking results, but in the majority of cases the most that can be expected is a variable degree of relief from pain and reduction of swelling when present. It is folly to expect diathermy to remove bony changes around joints. In many cases belonging to this group, diathermy, in order to produce the best results, should be accompanied by intelligent massage or, in certain cases, orthopedic measures may have to be considered. One thing I am certain of and that is that diathermy will cause the profession in general to re-learn what nearly all physicians knew forty or fifty years ago about the indications for the application of heat.

DR. J. C. BOEHM, St. Cloud: I wish to compliment the author of this excellent and instructive paper and congratulate the members of this section for the opportunity given us. I want to add one or two more remarks. I have treated the enlarged prostate with diathermy. If you study the surgery of the prostatic enlargement and follow up the cases it certainly is not very encouraging for the older men. I have treated twenty-five cases with the Neiswanger method, using his latest electrode, the galvanic current and normal salt solution. The electrode is a soft rubber rectal tube 15 inches long of 32 F caliber. The distal end is perforated with small holes for about 2.75 inches. Inside of this is a spiral wire of galvanized iron. The proximal end of this spiral wire is attached to a metal-fitting for the rubber tube of an ordinary fountain syringe and to this is soldered a receptacle for the conducting cord, and over this perforated end of the rectal tube a gold beater's skin condom is firmly placed and tied so as to include all of the perforations within this bag. This is introduced into the rectum till the perforated end is approximately in contact with the prostate gland. Normal salt solution of 125 to 130 degrees F is used by means of a fountain syringe. The patient is placed in Sim's position, the salt solution is now allowed to enter the gold beater's bag through the

perforations until moderately distended, then shut off. This is now connected with the positive pole. The negative pole is connected with a suitable wet pad placed on the abdomen, or better still on the back over the twelfth dorsal vertebra and spine. Turn on the galvanic current very slowly until 35 to 40 m.m. is reached. Continue this for 20 minutes three times a week until the prostate is practically normal in size. Usually about twenty-four to thirty-six treatments are necessary. The electrode must be thoroughly lubricated with soap-suds or other material that will not interfere with the conduction of the galvanic current.

I have used diathermy in a small way since 1902 in cases where the ankylosed ossicles of the ear were responsible for the partial deafness which in some cases was considerable, and restored practically normal hearing using both diathermy and high frequency as the modalities.

Since then, better machines and better outfits have been manufactured, and we know more and more as time goes on. The World War has taught us to recognize these modalities in the reconstruction process of crippled soldiers. Since then I have treated five cases of enlarged prostate, using diathermy and sinusoidal currents with a special prostatic electrode in the rectum so that the convex surface of the metal electrode comes in contact and covers the prostate. A well soaped mesh pad is placed on the abdomen or, better, over the twelfth dorsal vertebra and rapid sinusoidal is used for about ten minutes.

Diathermy is much more promising, more convenient and much more rapid. I myself have taken two treatments a week apart. Before this I had to get up four to five times during the night and now I go to bed the usual time, half past ten or eleven and sleep till six in the morning and I do not have to get up once during that time to void urine.

Using either of the methods, diathermy or the Neiswanger method, the man goes about his business the usual way, and when cured he is still a man with the delicate sympathetic nervous system intact and he retains his mental faculties as though nothing had happened.

In addition to the use of diathermy in traumatic cases I have them to place or wrap over the part a warm pad to retain the heat as long as possible. This, however, is not necessary when the patient is in the hospital and in bed. Be sure and have everything ready before you turn on the current; then slowly, step by step increase the current until the desired effect is reached; usually from 300 to 500 m.m. I take five minutes to reach the desired point, give a twenty minutes treatment and take three minutes to get back to zero. Right here is where the most common mistake is made. It makes a big difference whether it is done right or wrong. For this kind of cases, never turn the current on rapidly or suddenly. Take your time, be sure the electrode or electrodes and pads are thoroughly soaped with soap-suds or lubricated with material that is a good conductor of electricity.

With the average individual using diathermy today, all the knowledge he has about it is what the man who installed the outfit taught him. That is why there are so many failures in the use of both electricity or diathermy; in fact in the whole range of physiotherapy.

THE PROGRESS OF CARDIOLOGY DURING 1924: A REVIEW OF THE WORKS OF CLINICIANS AND INVESTIGATORS IN THE UNITED STATES

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(Concluded from page 236, April issue)

XIII. PHYSIOLOGY

Eyster and Middleton found that the venous pressure in the peripheral veins of normal man resting in the prone position rarely exceeds 11 c.c. of water. Higher readings, when local obstruction was excluded, invariably indicated cardiac decompensation. Marked changes in venous pressure under such conditions are apparently accompanied by corresponding changes in the volume of the heart, as determined by the roentgen ray. Changes in the peripheral vascular system, associated with alterations in the capillary pressure and flow, alter the venous pressure in the larger veins but little, if any. Venous pressure is a measure of the initial load on the right heart, and depends primarily on, and is an indication of, cardiac behavior.

The experiments of Andrus and Carter on the perfused hearts of terrapin and dogs permitted them to conclude that the excitatory process in the heart, as in other irritable tissues, represents a disturbance of ionic equilibrium between the cell contents and tissue fluids. They conclude that conduction is due to the direct stimulation of adjacent tissue by the disturbance so developed at the point originally excited.

Adolph and Fulton studied the effect of high temperatures on the circulation in man. They found that exposure to high temperatures increases the loss of carbon dioxide from the blood through the skin and lungs. This lowering of the carbon dioxide tension increases the hydrogen-ion concentration of the blood and ultimately leads to an excretion of alkali from the blood. The carbon dioxide dissociation curve of the blood is not significantly altered. The peripheral blood vessels are greatly dilated during exposure to high temperatures, and this dilatation continues indefinitely. The lack of a high resistance in the peripheral blood vessels prevents blood from returning to the

heart. The heart rate increases steadily and rapidly, and is even able to increase the systolic blood pressure. In spite of this compensatory action on the part of the heart, the blood flow back to the heart finally becomes inadequate. At this stage circulatory failure or shock is complete, with faintness. The rise in skin temperature seems to play the initiatory part in the control of the respiratory and circulatory reactions.

Johnstone demonstrated complete heart-block in chick embryos during the second, third, and fourth days of incubation. Heart-block was produced by applying ligatures around the heart at a time when, so far as known, it possesses neither nerves nor auriculoventricular bundle, but consists only of a continuous sheet of muscle cells, the myoepicardial mantle, surrounding an endothelial tube, the primitive endocardium. It seems probable that conduction through the myoepicardial mantle is from cell to cell. It has furthermore been shown that the normal conduction of the contractile impulse in the mantle is from sinus to auricle, auricle to ventricle, and ventricle to bulbus arteriosus. Heart-block was also produced by crushing or placing a ligature around the primitive heart at any level.

Tulgan, working with cats, was able to show that the increase in heart rate above that of the completely denervated heart cannot be considered as being due to inhibition, but must be due to some accelerator influence. An increase in heart rate may occur independently of the cardio-inhibitory center. Provided the heart is not beating at its physiologically maximal rate, a definite increase in the rate may be obtained by stimulation of an afferent nerve after the vagi have been divided.

XIV. ELECTROCARDIOGRAPHY

Year by year a greater interest has been manifested in electrocardiography and greater clinical application of this important branch of cardiology has been made. It has proved a wonderful asset in permitting an accurate identification of alterations in the cardiac mechanism, the findings obtained materially increasing the accuracy of prognosis and the records aiding the intelligent direction of treatment.

Dock and Levine, in an analysis of 614 cases of auricular fibrillation, found that in about 2 per cent of the cases a regular ventricular rhythm occurred with a heart rate more than fifty-five each minute, and was present as a transient phenomenon during the administration of digitalis.

In discussing transient and recurrent auricular fibrillation, Patterson says that he believes that transient auricular fibrillation may occur in normal hearts, that the condition is more common than is generally supposed, and may occur in various toxic conditions, reflex and nervous conditions, intoxications, and after surgical operations. A single attack does not necessarily indicate myocarditis, but recurrent attacks do indicate heart disease, and tend to become more frequent, severe, and finally permanent.

Barker's study indicated to him that extrasystoles occurring in hospital patients was an unfavorable prognostic sign. Extrasystoles of auricular origin are more serious than those of ventricular origin and the difference is sufficient to justify the attempt to distinguish between the two.

An interesting case of auricular flutter is reported by Wilson, in which vagal stimulation was followed by a definite increase in the rate of the circus movement. He explains this by the fact that the increase in auricular rate was attributed to a shortening of the path of the circus wave effected by a reduction in the length of the refractory period of the auricular muscle.

Reid reported a case in which ventricular tachycardia was followed by ventricular fibrillation. In discussing the nature of the mechanism he suggests that both disorders are due to the excitation wave traveling in a circular path through the ventricular muscle. This is said to be the first example on record in which electrocardiograms taken from a human subject have shown the sequence of ventricular ectopic tachycardia to fibrillation of the ventricles.

Porter cites a case of paroxysmal ventricular tachycardia, lasting one hundred and fifty-three hours, with recovery of the patient. The patient had previously had a coronary thrombosis.

Barker described a very rare occurrence, having had the opportunity of observing a case exhibiting a short run of irregular ventricular tachycardia during a paroxysm of auricular tachycardia.

A case of unusual interest was presented by Fenn in which the cardiac mechanism varied greatly from day to day as follows: (1) complete auriculo-ventricular dissociation, all ventricular complexes except one, the result of auricular activity; (2) auricular flutter; (3) a transition from 3:2 block to complete dissociation with a period of 2:1 block between, and (4) auricular fibrillation. The

latter mechanism persisted until the patient's death. At times the ventricular rate was very slow, during which some of the ventricular complexes were of the supraventricular type, while others resulted from different areas in the ventricle itself.

Gager studied a patient with a large pericardial effusion accompanied by complete heart-block which promptly disappeared after paracentesis.

Barker and Kinsella observed a dog suffering from experimental streptococcus endocarditis that shortly before death developed sino-auricular block. At necropsy an inflammatory process was found on the wall of the right auricle surrounding the sino-auricular node. The node itself was normal. Although an anatomic basis for sino-auricular block was found in this case, the authors issue the warning that in most cases probably there is no anatomic basis.

Feil and Katz, in a study of twenty-four patients with hypertension, determined the dynamic changes in ventricular systole. Simultaneous subclavian arterial tracings, heart sound graphs, and electrocardiograms were recorded. The measurement of the electrical systole was compared with the duration of the total systole, as derived by a modification of the formula of Lombard and Cope. In patients without signs of cardiac failure the total systole was found to be increased in one-third of the cases by 0.02 to 0.10 second. In the other two-thirds, little or no variation occurred. In patients with signs of cardiac failure the duration of the total systole was shortened in half the cases by 0.01 to 0.08 second, while in the others there was little variation from the normal. The shortening of the systole in these cases is believed to be due to an altered response of the muscle to overloading.

In an analysis of the electrocardiograms in cases of mitral stenosis, pulmonic stenosis and aortic regurgitation, White and Burwell found a definite relationship between abnormal right axis deviation and mitral and pulmonic stenosis, and between abnormal left axis deviation and aortic regurgitation. They also found that the auricular complex of the electrocardiogram in Derivation I, Derivation II, or both, is almost always abnormally prominent in cases of mitral and pulmonic stenosis.

The electrocardiographic studies of Cohn and Swift in cases of rheumatic fever have been an important contribution to this branch of cardiology. They found evidence of myocardial involvement in 95 per cent of the cases, chiefly reflected in the

ventricular components of the electrocardiogram.

Thacher analyzed the electrocardiograms of eight cretins and twelve Mongolian idiots, taken before the institution of treatment. In pure cretinism, as in myxedema, the T wave is lowered, flattened or even inverted and can be brought to normal by the administration of thyroid. No characteristic electrocardiographic changes were noted in Mongolian idiocy.

In a study on the changes in the mechanism of the human heart preceding and at death, Willius records his observations in six cases. In every instance auricular activity ceased before the ventricular; the shortest duration was fourteen and eight-tenths seconds; the longest, eight and one-half minutes. The slowest recorded sequential auricular rate was 22, while the slowest ventricular rate was 14. Two patients at the beginning of the graphic studies had auricular fibrillation, but this disorder did not occur as an intercurrent event. Nodal rhythm occurred in five cases; there were two instances of the reversed rhythm type, two of simultaneous contraction of auricles and ventricles, and one of diminished P-R interval associated with the P-R-o type. Three instances of complete block were noted, while sino-auricular block occurred twice, and delayed auriculoventricular conduction and partial heart-block once. One patient exhibited a period of auricular flutter with varying degrees of heart-block. Two patients had periods of pacemaker migration. There were two cases of bundle branch block. In three cases long periods of complete cessation of cardiac activity occurred, 9.4 seconds, 9.4 seconds, and 11.4 seconds, respectively. Ventricular fibrillation occurred in four cases and was the terminal mechanism in three. Fusion of the R and the T waves was noted in three cases.

A similar study of seven cases conducted by Kahn and Goldstein revealed that all or some of the last electrical complexes occurred after clinical death in each case. In each case, the first and main effect was failure of the sinus control of the heart, with assumption of the control of the auriculo-ventricular node. The cessation of the normal auricular contraction stimulus seems to be the critical phenomenon in the process of death. Before this happens, the sinus node shows irritability and depression in various sequences and degrees, and it is probable that if the disturbance could be controlled before the cessation of function, recovery of the heart might occur. Although ventricular

extrasystoles are common in the heart of the dying animal under experimental conditions, only two cases in human beings were encountered. Ventricular fibrillation occurred in two cases, in one instance momentary and in the other more prolonged. In both, this was followed by a very short period of recovery of rhythmic ventricular action, but without any regularity. The ventricles stopped beating before the auricles in three cases. In the other three, auricular action ceased first.

XV. METABOLISM AND VITAL CAPACITY

In studying the changes in the basal pulse rate and pulse pressure accompanying variations in the basal metabolic rate, Read found that the pulse rate varied directly with the basal metabolic rate, and that the co-efficient of correlation between the two was 0.74. The pulse pressure was also found to vary directly with the basal metabolic rate, the co-efficient of correlation being 0.62. In view of the fact that individuals vary in the amount of change in either pulse rate or pulse pressure, a more reliable measure of the circulatory system's response to variations in oxygen consumption is a combination of pulse rate and pulse pressure, as suggested below. Pulse rate and pulse pressure changes may be utilized as a rough guide to changes in the basal metabolic rate, especially if the relationship is once established by obtaining all basal figures simultaneously. The following formula is suggested which Read believes will give the basal metabolic rate within 10 per cent of its correct value in about half of the cases. $B.M.R. = 0.75 (P.R. + 0.74 P.P.) - 72$.

A case of ventricular tachycardia was studied by Dieuaide, who found a definite decrease in the oxygen saturation and in the carbon dioxide content of the arterial blood. The basal metabolism in one paroxysm was elevated to 16.7 per cent. The respiratory gases and basal metabolism were normal during the time of normal cardiac mechanism.

Joannides determined the effect of dyspnea produced by exercise, by increased carbon dioxide tension in the inspired air, and by lack of oxygen, on the vital capacity of the lungs. He found a decrease in the vital capacity when the pulmonary ventilation was increased. In a few experiments exercise produced a slight but definite increase in the vital capacity. After exercise a condition is produced quite similar to that in patients suffering from heart disease with reference to their vital

capacity, in that there was a tendency toward dyspnea and a diminution in the rebreathing interval. The increase in the vital capacity is secondary to the dyspnea, and depends primarily on conditions which produce dyspnea.

The vital capacity of college students based on a height standard was studied by Hewlett, who found it to be considerably higher than that of patients with cardiac complaints and without objective evidence of thoracic disease. In the series of patients with cardiac complaints, serious lesions were more common among men than among women. The symptoms most constantly associated with low vital capacity were cough and dyspnea. The seriousness of the various tabulated manifestations of heart disease, as judged by vital capacity averages, was, in decreasing order, extrasystoles, hypertension, left ventricular preponderance, enlarged heart, T-wave negativity in Derivation I, auricular fibrillation, and widened QRS group. Excluding aortic regurgitation and aneurysm, positive Wassermann reactions were not associated with any reduction of the vital capacity.

Gordon, Levine and Wilmaers made observations on a group of marathon runners with special reference to the circulation. They found that the average vital capacity of the lungs was normal. A fall of 17 per cent in the vital capacity occurred immediately after a race, which, however, returned to normal in twenty-four hours. The hearts of the marathon runners, as determined by the x-ray, were not enlarged, but immediately after a race there appeared to be a temporary decrease in size, which gradually returned to normal in about one day. The systolic blood pressure immediately after a race was normal, while the diastolic pressure was distinctly diminished.

XVI. X-RAY EXAMINATION OF THE HEART

Burnett contends that the physical methods of examination in the demonstration of aortitis, dilatation and aneurysm of the aorta have all proved undependable, while aortic thickening (increased density) and the pulsations of dilatation and aneurysm are demonstrated fluoroscopically with great ease. All factors influenced by motion, as presented in all the various positions of the heart, or of any of its chambers or appendages, are exhibited in a manner which furnished a mental picture far more valuable than an instantaneous record of one fraction of the cycle. At times an antero-

posterior exposure discloses a very slight or no deviation from the normal, but an oblique view discloses an increased density, enlargement, or pulsation not noted otherwise.

In an x-ray study of 350 cases of heart disease in children, Perkins found such examination of material aid in confirming physical signs. It presents an accurate method of differentiating normal from abnormal hearts in children at different ages. Progress of the disease may be determined by successive examinations. As a method permitting differentiation of congenital heart disease and disease of the thymus, it is invaluable. It offers important aid in distinguishing cardiac enlargement from pericarditis with effusion.

Tables are presented by Hodges and Eyster for the estimation of the normal cardiac area in man. They are derived from the formula: area in square centimeters = age $0.0204 +$ stature $0.8668 +$ weight $0.337 -$ the constant 63.8049 . If the heart is found to be 7 sq. cm. larger than the predicted area, the chances are 3:1 that it is actually enlarged. With 14 sq. cm. the chances of enlargement are 10:1; and with 21 sq. cm., 45:1.

XVII. MISCELLANEOUS

In a discussion of the relationship of the vegetative nervous system and the heart, Babcock em-

phasizes the importance of deciding the nature and cause of simple tachycardia or attacks of ventricular extrasystoles. The relation of these disorders of cardiac action to points of irritation in the abdomen or pelvis should be determined, which excite the action of the sympathetic or parasympathetic (vagal) portion of the nervous system. Co-existing valvular or myocardial disease may not be responsible for the disorders of heart action. In treating these cases it is important to eliminate the cause of the irritation rather than to treat the heart directly.

Dana concludes that more valuable information regarding the status of the circulation than that given by a jugular venous record, is often obtained by an auricular tracing, especially in cases of heart disease and pneumonia, and in the determination of cardiac efficiency in doubtful cases. The examination of auricular pressure curves in relation to periods of forced respiration may be of value.

Five cases of symptomatic polycythemia with cyanosis and dyspnea are reported by Morse. Four of the cases presented clinical features closely resembling Ayerza's syndrome, but due to pulmonary fibrosis rather than to primary disease of the pulmonary artery. The fifth case showed that extensive pulmonary syphilis may occur without Ayerza's syndrome.

THE SANBORN TREATMENT FOR DIABETES

This was formerly exploited to the public by the Analytical Laboratories, Inc., Chicago, which had for its president C. S. Harmon and for its medical director Ida M. Sanborn. Mr. Harmon died Dec. 14, 1924, the cause of death: diabetes mellitus. According to the advertising the treatment involved no interruption of ordinary pursuits, and a normal, nourishing diet, with no restrictions, was fundamental and essential from the start. It was announced that each case was individually diagnosed and treated under the personal direction of the medical director, Dr. Sanborn.

The treatment has been boosted by one Edwin F. Bowers, who has been connected with nostrum exploitation. According to Bowers "The Treatment Dr. Sanborn employs consists of a combination of Leptandrin, Sodium Sulph., Potassium Phos., Sodium Cacodylate, Sod. Bicar. and Capsicum, so adjusted and proportioned as to meet the wide range of pathological conditions that present, or the changes that may develop during the progress of the treatment."

About a year ago the Chicago office was closed and the next heard of the treatment was from "The Sanborn Laboratories," Battle Creek, Mich., and large newspaper advertisements sing its praises. It has for its "medical staff" Walter T. Bobo, M.D., and Ernest D. Perkins, M.D.—names that will sound familiar to students of contemporary quackery.—(*Jour. A. M. A., Mar. 7, 1925, p. 768.*)

SCARLET FEVER ANTITOXIN AND SCARLET FEVER SERUMS

The scarlet fever serum of Dochez and Blake is prepared by injecting a horse with culture medium and into this inoculating living streptococci which cause abscesses producing toxin against which the horse develops antibodies. The serum derived from the horse is an antistreptococcus serum.

The scarlet fever antitoxin prepared by the Dicks is secured by injecting a horse with a toxin prepared from the filtrate of cultures of specific streptococci isolated from cases of scarlet fever. With this toxin, the Dicks report, they have been able to produce symptoms in human beings that closely resemble the symptoms of scarlet fever. The toxin therefore is injected into a horse. The serum obtained from the horse is a scarlet fever antitoxin just as diphtheria antitoxin serum is prepared by inoculating a horse with the toxin of diphtheria bacilli elaborated by the diphtheria bacillus. The latter statement is true, of course, only to the extent that the Dick toxin is actually the specific scarlet fever toxin. The matter is complicated still further by the fact that the Dick antitoxin is concentrated, and it is claimed less likely to produce serum reactions than the unconcentrated Dochez serum.—(*Jour. A. M. A., Mar. 14, 1925, p. 819.*)

ETIOLOGICAL FACTORS AND DIAGNOSTIC POINTS IN SOME ABDOMINAL TROUBLES*

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In this short paper no detailed differential diagnosis of abdominal troubles is to be attempted, but rather a statement of some observations which have helped in diagnosing abdominal conditions and determining their treatment. Dr. Billings is credited with the statement that a good doctor should be able to diagnose 95 per cent of his patients' ailments without complicated laboratory equipment. We do not minimize laboratory methods, but the man who deserts positive history and physical findings to negative laboratory findings will miss many important cases. A good history plus one's own examination is of first importance. One is surprised at the number of cases that have been passed around as neurotics with histories which should have laid the foundation for a working hypothesis or would have been conclusive in light of the subsequent history.

A case in point is a patient, 66 years old, a contractor, who had seen many men and institutions in three states. When nineteen years old he was in bed two months with inflammation of the bowels and had never been right since. Always his stomach! stomach! stomach! and nerves. Couldn't read the newspapers, couldn't concentrate on anything, hadn't attended to business for six years. A neurotic.

Examination.—Acidity practically normal. Cap normal. Outline and activity of stomach normal. Hard to be sure of any local abdominal tenderness because of general tension and extreme nervousness.

Findings.—An obliterated appendix, postcecal in a bed of adhesions. A gall-bladder with walls so degenerated that when moderate traction was made the whole end tore off. Appendix removed and cholecystotomy done.

Course.—A slow recovery but for two years has taken an active part in business. For the last three months has been having recurrence of trouble which I think is referable to his gall-bladder again.

Between the patients who remember and magnify all their troubles and the ones who minimize everything or grudgingly admit them, are the patients who seem actually to have forgotten that once, twice, many times five, ten, twenty years ago they had attacks at intervals which are typical of gallstone or some other outstanding trouble. The so-called "silent gallstone" has spoken many times

in his younger active days and its persistent though less obtrusive influence can often be better diagnosed from a well developed history. The history of past or present focal infection is of great importance in considering abdominal conditions. Some men say they are tired of the term "focal infection"—call it any other name you want. A rose by any other name is just as sweet. However, if you want to practice successful medicine and surgery don't overlook possible distributing points of germs and their toxins. We know that beside the actual germ distribution with its many known results we have the action of the toxins on the central nervous system and because this has many times a noisy way of manifesting itself, the sympathetic nervous system, which it evidently likewise affects, is not so often considered. Impaired thyroid, adrenal, pancreatic, stomach and intestinal function can be brought about through the adverse influence from focal infection sources just as readily as the known motor and sensory disturbances are brought about from this same source. From an abdominal operating standpoint we are dealing with organs which are largely under the jurisdiction of the sympathetic nervous system and the importance of a smoothly working mechanism is not to be under-estimated.

For safer, quicker convalescence from operations have all active focal infection removed before operating if you have a choice in the matter. Many times the patients don't come back because they are cured or think they are, which may be the same thing. They haven't had any trouble since those teeth were removed, that septum straightened, or that antrum drained; the ulcer stayed cured, the gallbladder hasn't given any trouble and they "*never felt better.*"

The diagnosis of appendicitis is not always easy. Likewise the appendix is not always easily removed, otherwise one would hardly be justified in bringing this subject up again. In an obscure case that sounds like an appendix but doesn't localize right, don't fail to make a rectal examination whether it is a man, woman, or child, and a vaginal besides if it is a woman. A big percentage of these cases of pelvic appendicitis are drainage cases because they are not recognized soon enough. Two cases of this type came to me within the last year with some after results which were interesting and instructive. Both were men and came from distance.

*Presented before the annual meeting of the Minnesota State Medical Association, St. Cloud, October, 1924.

The first had a walled off pelvic abscess which had an amputated gangrenous appendix and a large enterolith. I let him go home in three weeks. He came back in a month with a very tender mass in the appendix region which only required an incision to evacuate a lot of pus. He went home in two weeks with the wound healed. He wrote me several times during the next three months saying he had attacks that reminded him of his old trouble and shortly after that came down again with a hard fist-sized tender mass under the last scar. Under the abdominal wall was a mass of omentum and more pus. I drained again. Next time he went to Rochester. He still felt kindly to me and came back and told me all about it. He said that all the men who examined him except Dr. Will Mayo thought it was malignant and he said that his age and his history would warrant it still being appendicitis and he got an appendix an inch long to prove it and the man is well.

The second man I did not do the primary operation upon but the history I got from the doctor was a duplicate of my case except as regards the enterolith. After the original operation there had been two where abscesses were drained and he was still having trouble. An x-ray disclosed a shadow of a stone which after further examination we were sure was not in the ureter or bowel. In a dense bed of adhesions we recovered an enterolith as large as a bean and were much pleased with ourselves. The patient made a nice operative recovery. About a month later the man's wife called on long distance saying he was having more trouble and was coming down. I was thankful for one more chance and how he escaped getting to Rochester I do not know but I got an appendix an inch long, and he has been well ever since.

The lesson to be learned from this is that following an operation where nature and not you did the amputating she is apt to leave the organ as long as possible so it can function again. Do it yourself and know it is done if symptoms recur. You can have frequent bowel movements in acute appendicitis without laxatives having been given. My observation has been that most of these cases have post-cecal, post-peritoneal appendices. They have the added disadvantage of less rigidity and tenderness and seem less urgent from the operative standpoint, but it is not so. A case that seems abdominal in its urgent symptoms and giving a leucocytosis of 20,000 or over in the first twenty-four hours should be very carefully studied. Pneumonia with actual peritoneal irritation will do this thing. There has been one finding which has been of service to me in substantiating the diagnosis of recurrent cholecystitis: it is quite persistent and can frequently be brought out in the history. The usual history would be this: The patient complains of a full, uncomfortable feeling in the pit of the stomach. He cannot eat or is more uncomfortable if he does. He may be nauseated or may vomit and

have some tenderness over the gallbladder. He may have a slight fever and slight leucocytosis, which may last a few days or a week. Generally during a vomiting spell the gallbladder empties, the irritating, infected bile acts like a physic, giving a number of loose movements, after which the patient usually makes a rapid recovery.

There is evident need of a standard physical appraisal of the pathology of the gallbladder. Seeing a gallbladder, its surrounding liver changes, the duodenum and stomach, are a great advantage but many times we have to depend upon the sense of touch. My rule for making a longer incision for inspection is:

1. A tense gallbladder, one which does not empty under reasonable pressure.
2. Adhesions to the gallbladder.
3. Stones in the gallbladder.
4. A thick walled bladder.

All these points are quite readily determined if you can get a finger on the gallbladder. The blue color of the gallbladder is not so important to me as it used to be; at least I have discriminated my type of blue. The tense gallbladder regardless of its personal appearance otherwise is potentially a diseased one and my disappointments in good results have been from leaving it in rather than from taking it out. A pre-operative measure which may be used in suspected cases of this type is to reduce the weight and among other waist manipulating exercises is one where the closed right fist is placed at the edge of the ribs over the gallbladder region, the left hand is placed flat against the fist and both pressed against the right thigh by forceful prolonged pressure from the trunk. This pressure will be readily measured by the patient, for a gallbladder that does not readily empty is painful. The patient who will persist in practising this will get relief or an operation.

There is one etiological factor of gallbladder disease which should be emphasized and that is the mechanical obstruction from fat deposit around the cystic duct producing diminished calibre and increased angulation. The individual does not have to be obese to develop this. Fair, fat, forty and gallbladder disease are a commonly known quartet. It is at this time that the low grade infection that had been draining begins to dam back and give positive symptoms due to this source of obstruction. It is conceivable that many cases were not infected until this bile stasis and im-

paired circulation rendered the organ more susceptible. The source of infection may be through the portal circulation as per Graham and others, but my best judgment makes me give equal importance to other focal points. Why the appendix which is credited with getting its infection largely by the hematogenous route should preclude the gallbladder getting its that way is not clear. Under certain conditions they both drain their contents very poorly. The appendix has more lymphoid tissue than the gallbladder and carries normally infections in its lumen. These histological and resident properties of the appendix render it more susceptible to disease than the gallbladder, but in proportion as it has lymphoid tissue and poor drainage the gallbladder is just as prone to disease as the appendix and I cannot see why there should be any argument over its not sharing a like source of hematogenous infection. The gallbladder can be the source of active prolonged infection. A recent illustrative case in our hospital was that of an *attache* who had had typhoid nine years before. He was relieved of a stone which gave pure cultures of typhoid bacillus. This case might have explained the occasional case of typhoid fever which developed without known cause.

The following case reports are submitted:

H. B., a male student, aged 22, had always possessed good habits.

At five he had scarlet fever. In the following year when he had jaundice, he suffered from many attacks of diarrhea. Never robust, he always had to be careful of his diet. His bowels were inclined to be overactive. He had not been especially subject to colds or throat troubles.

In March, 1920, he developed a multiple arthritis associated with a diarrhea. In May he became helpless and was in bed for a year with rheumatism and diarrhea. He gradually improved so he could get up and around with crutches, but had been sometimes better and sometimes worse ever since. All his teeth and tonsils had been removed in Rochester in 1921.

The patient came to the office in August, 1923, on crutches, stating that for the past six weeks he had been especially bad. He was having eight to ten bowel movements daily and he complained of soreness of the abdomen.

The patient was anemic and weighed only 103 pounds. He had a rheumatic spine with arthritic hooks as shown by the x-ray. He was unable to walk erect. Movement of all the larger joints was painful, without special swelling, but the joints were prominent because of atrophy of muscles. The thyroid was small; heart and lungs negative. The abdomen was tense with tenderness and rigidity over the gallbladder region. Rectal examination was negative. The laboratory reported the urine: sp. gr. 1018, albumin one plus, a few pus cells being present. Blood

pressure: 118/60; pulse 104; hemoglobin 70%; red blood cells 3,500,000; white blood cells 8,500.

He was given vitamine compound, Lily, and put upon acidophilous milk and such other food as he found he could take. He was afraid to eat anything. He gained on this treatment and there was improvement of the bowel movements but he kept having relapses.

In January this year he was still tender over the gallbladder, so he was sent to the hospital and operated. The gallbladder was of average size, thick walled, moderately distended, greyish-white in color, the mucosa showing small yellowish deposits. The liver showed moderate local scarring. Microscopical findings of both gallbladder and appendix were those of chronic cholecystitis and appendicitis.

Today he weighs 124 pounds, has formed bowel movements, eats everything except raw fruit, uses a cane instead of crutches, and all that troubles him is the deformities resulting from his old arthritis. It is too much to say that the gallbladder or the appendix were the primary causes of his arthritis. We did not see how diseased his tonsils or teeth were, but the bowel condition which may have been a factor in the arthritis was very probably influenced by both gallbladder and appendix.

Another case I wish to report is one with a teratoma originating from the left ovary, and weighing 11 pounds. It consisted of a multilocular cyst with teeth, hair and bone, the bone being a section of an orbit. The location of the tumor, the greater portion being above the level of the navel, added considerably to the speculation as to what it was before operation.

The woman was 37 years of age, married, a native of Finland. Weight 120 pounds. She had worked on a farm until coming to the hospital.

She was married at 24 years, never pregnant. In 1915 she was operated for retroversion and a growth on the left ovary. She never felt as well after the operation as before, but her general health was comparatively good until last year. She has had increasing heartburn, is hungry, but cannot eat because of an uncomfortable pressure in the abdomen. The bowels are regular. She was examined two years ago and told she had a tumor as big as an orange. Since then she has noticed her abdomen increasing gradually in size.

Blood pressure on examination was 118/80, pulse 80. The abdomen appeared like a nine months pregnancy.

Firm, rounded, tumorous masses were felt four inches above the navel extending to the right and left for a distance of five inches on either side of the navel. The greater part of the tumor seemed to be from the navel upward. Pelvic examination revealed a large rounded mass also, with no especial tenderness. Air inflation of the rectum produced only discomfort in the epigastrium with no coils of bowel visible. Fluoroscopic examination of stomach showed a very small stomach lying horizontally against the diaphragm. The liver is up to the fourth interspace. The costal arch is widely separated.

Operation.—Incision was made in the right rectus near the center, a markedly thickened bluish omentum which was attached to the tumor at a number of points and free clear watery fluid presenting. No bowels were seen. After considerable difficulty in establishing our anatomy we found

the growth occupied the whole lower two-thirds of the abdomen, small bowels and transverse colon lying in the epigastric space while the stomach, the ascending colon, sigmoid and rectum were upon a stretch from pressure upward and their mesenteries had been greatly elongated. The left broad ligament was thinned out in a fan shape and had its attachment to the tumor on the level of the navel. The liver was compressed, had many adhesions and the surface was roughened as in a hepatitis. Its color was whitish from scar tissue. The gallbladder wall was thickened and considerably distended. Kidneys and spleen seemed normal in size. Stomach and duodenum were normal. The uterus was flattened out to the thickness of a hand. The right ovary was a cyst and was removed. The appendix had been removed at a former operation. This patient maintained a pulse of 90 all during the operation, was given intravenous saline before leaving the table and went to her room with a pulse of 80.

A patient, J. T. J., aged 32, gave the history that he had been gassed and severely wounded in France. He had been under observation for the past three years for chronic nephritis. One year ago he complained of pain in the abdomen in the region of the navel, pain in the back and constipation. The abdominal pain gradually grew worse. At home he was relieved by enemas.

He consulted Dr. F. Spicer September 2, 1924, with the following symptoms: Very severe pain in the abdomen radiating to the back, partially relieved by enemas. Other symptoms of chronic nephritis and hypertension.

On examination he showed a large palpable, pulsating tumor in the abdomen below the umbilicus, slightly to the left of median line. No murmurs nor thrills were elicited.

Briefly a diagnosis of abdominal aneurism was made. There was a difference of opinion in regard to the mass and an exploratory laparotomy was done. An aneurism about five inches long and three and a half inches wide in the greatest diameter was found lying under the bulging more to the left of the navel. The lower end of the aneurism was found near the bifurcation of the aorta. The mesentery above the aneurism was on a stretch with the vessels dilated. Immediately following the operation the patient felt considerably relieved, but after about ten days the pain returned, greatly increasing in severity, until only hypodermics of morphin relieved him. The constipation was very marked and an enema usually gave him some relief. The blood pressure upon admission, September 2nd, was 210/130, on October 1st, 160/110.

On October 8th at 5:30 a. m. the patient died very suddenly from hemorrhage.

DISCUSSION

DR. J. P. SCHNEIDER, Minneapolis: Mr. Chairman—I presume my excuse for discussing a surgical paper in the surgical section is that I am firmly convinced that an internist unassociated intimately with a surgeon is an unsafe internist, and likewise that a surgeon unassociated with an internist is an unsafe surgeon.

To illustrate—in the paper prior to Dr. Bagley's, relative to perforated gastric ulcer, I am sure that the average unassociated internist confronted with this urgent surgical problem, would be inclined to be too dilatory and spend too much valuable time in arriving at a diagnosis. This

will occur again and again unless the internist will follow the surgeon into the operating room and there be impressed with the pathology. On the other hand, what is the besetting sin of the average unassociated surgeon? It is that he operates altogether too frequently, perfectly honestly, upon psychoneurotics and patients with organic nerve disease simulating an abdominal surgical lesion. He knows it and we all know it and the only way in which he can be properly safeguarded, is to have a good internist and a good neurologist protect him.

I cannot bring that lesson home better than to cite a case in point which I saw last night in the western part of the state where I was called because two local surgeons had come to an impasse. One said it was gallbladder and the other said it was angina pectoris. Instead of the patient having either, she had a psychoneurosis-phrenocardia (Hertz). This woman, thirty-five years old, lived on a farm and had had in a brief span five children. In her last pregnancy, she had had a severe eclampsia, which left her so frightened as to make it seem to her imperative that she have no more children and the easiest way in which she could accomplish this was to act sick. Now to dig that fact out was the important thing.

I think Dr. Bagley's rare cases show that the abdomen is a wonderful hiding place—it takes us years of practice in order to become relatively certain of obscure points. It takes even longer to become a good chronologist and develop a good history, and, lastly, we must constantly be on the watch for those human beings who are sick in soul, but not in body.

DR. J. A. JOHNSON, Minneapolis: The subject of diagnosis of abdominal lesions is a large one and has many varied aspects. The cases cited in Dr. Bagley's paper are largely atypical from the standpoint of history and physical findings. It is not difficult to diagnose the case with typical findings—the hospital interne can usually do that. There are, however, a large group of atypical cases that require careful investigation. I would like to call your attention for a moment to a group of cases with abdominal symptoms that are due to extra-abdominal lesions. Among the most important of these are diaphragmatic pleurisy, right lower lobe pneumonia—especially in children—the referred pain being transmitted through the intercostal nerves; gastric crisis in tabes; the nerve root pains transmitted to the abdomen in lesions of the spine—notably in malignant growths and tuberculosis; herpes zoster in its early stages may also simulate abdominal lesions. In all of these, the pain is superficial and should not lead one astray. The pains of angina pectoris may simulate an upper abdominal lesion and I have seen gallbladder lesions that were diagnosed as angina pectoris.

Then, there is a large group of psychoneurotics presenting themselves with numerous complaints. These are difficult because they have to be proven negative and often require a great deal of time and consultation for a final decision.

DR. W. R. BAGLEY (closing): I think the surgeon, being a man of action, is often too impatient to see results. I am sure Dr. Schneider's remarks are very pat and right. We do need the balancing judgment of the internist and I certainly appreciate my associates' help on all these cases.

THE RELATION OF THE DOG TO PUBLIC HEALTH*

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From time immemorial the dog has been man's closest friend. He has gradually worked himself into the human household, so that at present he is usually considered as a member of the family. He has conquered all his competitors for these privileges, except, perhaps, the cat and the pet birds. There is no question about the fact that he is a true friend to man. He has repeatedly saved human life and often gave his own to save that of his master. In spite of it all, however, the dog is a source of danger to man, because his master has removed all restrictions from him. Unwillingly and unconsciously the dog may carry disease from one person to another. He may easily carry tuberculosis, infectious diseases, rabies, skin diseases, and intestinal parasites. The dog is not to blame for all of this; the blame must rest on his master who allows the dog to eat either raw or dirty food, allows him to run around and intermingle with persons or animals infested with disease. The dog returns home and carries disease to the household.

That the dog may be a source of danger was emphatically impressed upon us by the observation that the majority of dogs operated on for experimental purposes were found to contain animal parasites, even though they were apparently healthy. It is surprising how little attention has been paid to this topic when one considers the many public health, hygiene, and preventive medicine organizations. Very little has been written with a view to emphasize the dog as a carrier of disease. The few good papers have, unfortunately, been buried in very inaccessible or specializing publications. Hall (M. C. Hall: *The Dog as a Carrier of Parasites and Disease*; U. S. Dept. of Agriculture, Bulletin No. 260, Nov. 23, 1915) wrote an excellent article that deserves very wide publicity. Cameron (Thomas Cameron: *The Dog as a Carrier of Disease to Man*; *Lancet*, March 18, 1922, p. 564) also wrote a very instructive article,

but it is limited to problems that concern England primarily. It may be well to mention other less important articles:

1. In *Dirty Dogdom* (*British Medical Journal*, vol. 2, p. 85, July 15, 1916).
2. *When a Dog Becomes a Nuisance* (A. H. Bush: *Public Health*, Michigan State Board of Health, January, 1917, pp. 20-22).
3. *On the Prevalence of Entozoa in the Dog, With Remarks on Their Relation to Public Health* (*Proceedings of the Linnean Society Zool. Section*, vol. 9, p. 281, 1868).
4. *Les Parasites Transmissibles des Animaux a l'homme, Envisages Specialement au Point de Vue de la Prophylaxie* (a Railliet, *Transactions of 7th International Congress of Hygiene and Demography*, 1892, vol. 3, section 3, pp. 57-87).

It is perhaps sufficient only to mention the various diseases that the dog may carry. Two of the most important are tuberculosis and rabies. In the first case the dog acts as a carrier of the tubercle bacilli by coming in contact either with a diseased human or else with contaminated articles. In rabies, the dog acts as an intermediate host of the rabies virus. The parasites carried by the dog may be conveniently classified under two heads, namely, skin parasites, and intestinal parasites. A more detailed differentiation may be given in an outline form:

I. SKIN DISEASES

A. Ringworm

- a. *Trichophyton microsporum oospora*
- b. *Eidamella*

B. Mange

- a. *Sarcoptic* (transmissible to man)
- b. *Follicular* or *demodectic* (may be transmissible to man)
- c. *Auricular* (not transmitted to man)

C. Lice and Fleas

- a. *Trichodectes canis* (host of dog tapeworms)
- b. *Pulex irritans*
- c. *Stenocephalus canis*

D. Chiggers

(Attack man but common in tropical countries)

*From the laboratory of experimental surgery, The Medical School, University of Minnesota. Read before the Hennepin County Medical Society, Minneapolis, Minn., on February 4, 1925.

E. Ticks

- a. *Dermacentor variabilis*
- b. *Dermacentor venustus* (carrier of Rocky Mountain spotted fever)

II. INTESTINAL PARASITES

A. Protozoa

- a. *Entameba histolytica*
- b. *Giardia intestinalis*
- c. *Trypanosoma evansi* (not yet reported in U. S. A.)

B. Nematodes (round worms)

- a. *Toxascaris limbata*
- b. *Eustrongylus gigas*
- c. *Trichinella spiralis*

C. Trematodes (flukes)

- a. *Opisthorchis felineus*
- b. *Paragominus kellicotti* (lung fluke of hogs)
- c. *Clonorchis sinensis* (common in Japan and China)
- d. *Clonorchis endemicus* (common in Japan and China)
- e. *Schistosoma japonicum* (common in Japan and China)

D. Cestodes (tapeworms)

- a. *Echinococcus granulosus*
- b. *Coenurus cerebralis* (gid)
- c. *Dipylidium caninum*
- d. *Dibothriocephalus latus*

III. ARACHNIDA

A. Tongue worms

(*Linguatula rhinaria*)

It is evident from this brief outline that the dog is a definite source of danger if no restrictions are placed upon him. To remedy existing conditions the most important consideration to remember is to treat the dog as a dog and not as a human being. Dispose of all stray dogs. Insist on muzzling dogs, especially when they are out on the street. Treat them periodically with vermifuges. Keep them free from skin parasites. Test dogs in houses where tuberculosis or other transmissible disease is present. Don't allow the dog to eat from the same plate which you use. Don't allow the dog to become too familiar with the children. Castration is frequently a means of keeping the dog at home.

BLOOD PRESSURES DURING PREGNANCY,
LABOR, AND PUERPERIUM*

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and

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For many years blood pressure has occupied a position of great importance in the minds of obstetricians, and a vast amount of literature has accumulated relative to hypertension and toxemia in late pregnancy. In spite of these facts comparatively little work has been done in the study of blood pressures in normal pregnancy, labor, and puerperium.

May it not be that the same toxins which in a relatively small number of cases give rise to the symptoms of a true toxemia are present and exert their influence to a less marked degree in cases of normal pregnancy? Would the effects of such toxins be counteracted or would they be accentuated by the increasing size of the intra-abdominal uterine mass with its increased vascular area? These questions and many others of equal significance arise in the consideration of blood pressure changes during gestation, parturition, and the puerperium.

The purpose of this paper is to show the trend of blood pressure in normal pregnancy, to add a little to the information at hand concerning the blood pressure reaction of the maternal organism during and after labor and in the puerperium. Various factors which may influence the maternal blood pressure and pulse rate are considered.

Bailey, in 1911, states that the average blood pressure in the last weeks of pregnancy is 118, and adds that any blood pressure over 150 should be investigated.

Danforth, in 1913, in reporting pregnancy observations in 115 private cases, concludes that (1) the average blood pressure of the pregnant woman is less than that of the non-pregnant, and (2) in many cases labor causes a rise of arterial tension.

In a series of fifty cases with observations during pregnancy and labor, Voegeler, 1907, shows that the normal limits of blood pressure during pregnancy are 100 to 150 in all cases. He also states

*Presented before the Minnesota Academy of Medicine, December 10, 1925.

that during labor the pressure is higher, but after delivery any pressure above 150 or under 90 must be considered abnormal.

Donaldson, in 1913, after a study of apparently normal cases of pregnancy and labor, concluded that there is no increase in blood pressure during pregnancy and no fall following delivery.

Discussing an article by Hirst, 1915, Norris remarked that the average blood pressure in the early months of pregnancy is between 110 and 130, and adds that there is little change as pregnancy advances.

Warfield defines the phases of the auscultatory method of taking blood pressure, placing the systolic pressure at that point where a short, sharp click is first heard, and the diastolic pressure at the level where the loud tone (third) suddenly becomes dull. He then adds that diastolic pressure is not only more important than systolic, but also not so variable.

In 1909 Skeel concludes (1) that with the slight rise occurring in the last two months of pregnancy, the blood pressure should not exceed 150; (2) that anything in excess of 150 should be considered abnormal, and (3) that blood pressure is somewhat elevated during labor, and if high, it should decrease to normal after labor.

From a series of 450 cases, Newell, 1915, places the average systolic pressure at 118, with a gradual rise of 10 to 15 in the latter months of pregnancy. In this series there was one patient who had abnormal symptoms, with a blood pressure between 100 and 130.

In a series of 524 cases Litzenberg found that 80 per cent of the patients had blood pressures of 130 or less, and in 60.5 per cent the systolic pressure ranged from 100 to 130. Fifty per cent of patients with a systolic pressure of 160 to 180 have toxemia, while every patient with systolic pressure ranging above 180 has toxemia. He concludes (1) that the normal systolic blood pressure in pregnant women is 100 to 130; (2) that the normal diastolic blood pressure is from 60 to 85, and (3) that the normal pulse pressure is from 30 to 50.

Blood pressures, systolic and diastolic, together with the pulse rate, were taken on 100 unselected private patients at the Swedish Hospital. A Baumanometer was used, the systolic pressure being noted at the point where the sound first reappears

and the diastolic pressure at the point of transition from the loud systolic note to the dull and feeble sound heard just before the disappearance of all sound. The pulse rates were taken for periods varying from fifteen seconds to one minute.

Such readings were taken on each of the 100 patients, beginning during labor. In the primiparous cases the labor readings were taken during the second stage of labor, while in the multiparous cases the readings were taken in the first stage, but in no case was the blood pressure taken during a pain. As soon after delivery as it was technically possible the "after labor" readings were taken, but because of the variable time used in perineal repair the time element of this reading varied. Following labor, readings were taken at twelve hours, twenty-four hours, two days, three days, and so forth, to the time of discharge from the hospital. The daily blood pressure and pulse rate were taken between ten o'clock and twelve noon.

Table 1
SYSTOLIC BLOOD PRESSURE READINGS IN RELATION TO LABOR

Entire Series							Antepartum Group										
							Antepartum				Postpartum						
Time	No. of cases	Range	Average	Mode	Median	Coef. of variation	No. of cases	Range	Average	Mode	Median	Time	No. of cases	Range	Average	Mode	Median
D L	100	104-168	130.64	120	126	2 m.	9	90-124	107.11	110	110	D L	25	106-168	129.52	120	122
A L	100	78-196	126.62	120	122	3 m.	11	90-128	109.63	110	110	A L	25	102-196	120.55	114	118
12 h.	100	94-164	119.28	120	116	4 m.	16	96-126	110.81	110	120	12	25	100-164	119.28	110	116
24 h.	100	96-168	117.40	110	114	5 m.	18	92-128	111.66	114	124	24	25	100-168	114.98	110	110
2 d.	100	94-174	117.26	110	114	6 m.	22	90-128	110.27	114	120	2	32	100-174	114.00	110	110
3 d.	100	92-174	117.24	110	114	7 m.	21	92-128	114.43	116	126	3	32	92-160	115.03	110	112
4 d.	100	92-168	115.86	114	114	8 m.	24	96-128	114.91	114	124	4	32	100-168	116.14	112	114
5 d.	100	90-160	115.40	108	112	9 m.	22	90-142	117.22	118	128	5	32	90-160	114.43	110	110
6 d.	100	92-154	114.84	110	114	9 m.	20	102-160	115.80	120	126	6	32	92-150	114.16	112	112
7 d.	100	96-158	114.62	110	114	9 m.	22	102-146	116.63	112	120	7	32	96-144	112.51	116	114
8 d.	100	102-154	113.96	110	112	9 m.	18	100-160	119.11	128	122	8	32	96-140	112.96	110	110
9 d.	90	94-154	113.76	110	112	10 m.	8	110-128	116.49	118	118	9	32	100-136	114.22	106	110
10 d.	72	92-150	113.01	112	114	10 m.	5	110-124	116.00	124	118	10	32	100-136	113.11	104	112
11 d.	46	96-158	113.70	110	114							11	32	96-134	111.36	110	110
12 d.	34	96-130	111.86	110	110							12	32	96-130	110.21	110	110
13 d.	20	100-134	111.60	110	110							13	32	100-126	110.42	106	110
14 d.	15	96-126	108.80	110	110							14	32	96-126	109.75	110	110
												15	32	96-126	109.00	110	110

Pre-eclamptic Group						Eclampsia Group						Dorhane Group					
D L	6	160-168	166.0	164	164	D L	24	112-166	137.41	132	132	D L	5	120-152	135.00	128	128
A L	6	132-196	171.3	146	146	A L	24	76-168	133.33	120	122	A L	5	112-124	113.60	114	114
12 h.	6	136-164	150.0	164	146	12 h.	24	94-164	131.06	110	120	12 h.	5	110-114	111.20	110	110
24 h.	6	122-166	153.0	158	158	24 h.	24	96-162	120.00	112	114	24 h.	5	108-114	109.20	110	110
2 d.	6	132-170	154.6	154	154	2 d.	24	100-152	119.41	112	114	2 d.	5	100-112	107.60	108	108
3 d.	6	132-176	155.3	154	154	3 d.	24	92-152	119.00	110	118	3 d.	5	96-116	106.40	110	110
4 d.	6	132-168	150.0	150	150												
5 d.	6	122-160	147.6	160	148												
6 d.	6	114-156	141.0	140	140												
7 d.	6	124-158	140.3	124	142												
8 d.	6	124-158	139.3	138	138												
9 d.	6	126-154	136.0	134	134												
10 d.	6	128-150	136.2	128	134												
11 d.	6	118-158	134.0	130	130												
12 d.	6	118-130	124.0	130	130												

Gestor oil and gasoline Group				D L - During labor				
5 d.	6	112-124	113.60	114	114	5 d.	1	Hour
6 d.	6	112-124	113.60	114	114	6 d.	1	Hour
7 d.	6	112-124	113.60	114	114	7 d.	1	Hour
8 d.	6	112-124	113.60	114	114	8 d.	1	Hour
9 d.	6	112-124	113.60	114	114	9 d.	1	Hour
10 d.	6	112-124	113.60	114	114	10 d.	1	Hour
11 d.	6	112-124	113.60	114	114	11 d.	1	Hour
12 d.	6	112-124	113.60	114	114	12 d.	1	Hour

Owing to the fact that these patients were in the hands of the various staff doctors, some of them were allowed to go home on the eighth day, some on the ninth, and so forth. Consequently the number of cases decreased from the eighth to the fourteenth day. Data were obtained on 100 cases for eight days, on ninety for nine days, and on seventy-five, forty-eight, thirty-four, twenty, and fifteen respectively from the tenth to and including the fourteenth day. Through the courtesy of Dr. F. I. Adair the readings six weeks postpartum were obtained from twenty-seven patients of this group.

Thus far the work included only labor and postpartum observations, but following a suggestion from Dr. F. L. Adair, and through his courtesy, antepartum readings were obtained in twenty-seven cases. The method used in these cases corresponds to that described above. These observations in-

Table 2
DIASTOLIC BLOOD PRESSURE READINGS IN RELATION TO LABOR

Entire Series										Antepartum						Postpartum					
Time	No. of cases	Range	Average	Mode	Median	Coast- to- to- of	No. of dates	Range	Average	Mode	Median	Time	No. of cases	Range	Average	Mode	Median				
D L	100	58-108	81.62	80	82	2 m.c.	9	48-78	65.33	70	70	D L	25	60-104	79.84	84	84				
A L	100	42-124	79.46	80	80	3 m.c.	11	50-78	65.33	70	70	A L	26	65-164	79.52	84	86				
12 h	100	42-124	79.46	80	80	3 m.c.	11	50-78	65.33	70	70	12 h	26	64-164	79.72	80	79				
24 h	100	58-108	81.62	80	80	2 m.c.	9	48-78	65.33	70	70	24 h	25	65-164	79.12	80	79				
3 d	100	56-104	79.04	78	78	3 m.c.	22	50-74	64.18	70	70	3 d	27	64-104	72.39	70	70				
3 m	100	56-104	78.92	70	70	7 m.c.	21	50-78	67.62	70	70	3 m	27	64-104	72.51	70	70				
4 d	100	54-102	77.12	70	70	8 m.c.	24	54-78	65.33	68	70	4 d	27	68-102	72.25	70	70				
4 m	100	50-108	77.12	70	70	6 m.c.	24	50-78	65.33	70	70	4 m	27	68-104	72.53	70	70				
5 d	100	56-100	77.42	72	72	9 m.c.	20	50-84	70.30	68	70	5 d	27	66-102	72.51	68	70				
7 d	100	54-108	77.26	70	72	9 m.c.	22	54-78	67.36	72	70	7 d	27	64-102	72.68	72	72				
8 d	100	48-102	75.04	72	72	9 m.c.	24	48-72	64.72	72	72	8 d	27	60-96	72.68	72	72				
9 d	100	50-108	77.12	70	70	10 m.c.	24	50-78	65.33	70	70	9 d	27	64-102	72.68	72	72				
10 d	75	50-96	73.72	72	72	10 m.c.	5	54-76	67.00	70	70	10 d	27	60-96	72.13	66	72				
11 d	48	58-100	75.41	74	74							11 d	24	62-98	72.24	74	74				
12 d	34	64-82	75.17	70	72							12 d	19	54-80	70.21	70	70				
13 d	4	20-66	75.00	70	70							13 d	4	20-66	70.00	70	72				
14 d	16	50-80	71.20	72	72							14 d	8	60-80	71.00	72	72				
												6	27-62	75.66	53	70					
Fra-sclamptic Group										Pituitary Group						Morphine Group					
D L	6	60-108	103.00	90.00	90	D L	24	48-104	61.70	82	82	D L	5	70-90	80.00	80	82				
A L	6	67-124	100.33	90.00	90	A L	24	42-107.5	68.10	90	88	A L	6	70-80	76.00	74	74				
12 h	6	60-104	90.68	88	88	12 h	24	64-104	75.92	70	74	12 h	6	64-74	69.60	70	70				
24 h	6	68-108	97.00	96	96	24 h	24	58-108	75.00	72	74	24 h	6	64-74	70.00	70	70				
3 d	6	60-108	97.00	96	96	3 d	24	64-104	75.92	70	74	3 d	6								
3 m	6	67-104	91.66	96	96	3 m	24	64-104	75.42	70	72	3 m	6	66-80	69.60	70	70				
4 d	6	68-102	93.00	90	90																
5 d	6	62-104	92.60	90	92																
7 d	6	64-102	93.00	90	90																
8 d	6	65-92	91.66	84	90	D L	6	60-80	69.56	72	70										
9 d	6	60-96	91.00	94	84	D L	6	62-96	71.00	70	70										
12 d	5	57-98	86.00	86	86	12 h	6	56-84	69.33	72	66										
13 d	2	57-96	76.50	86	86	24 h	6	60-78	68.00	70	70										
14 d	6	67-100	86.4	82	82	2	6	60-76	72.00	70	70										
11 d	2	80-82	81.00	82	82	3 d	6	65-92	70.00	70	70										

clude nine cases in the second month of pregnancy, eleven in the third, sixteen in the fourth, eighteen in the fifth, twenty-two in the sixth, twenty-one in the seventh, twenty-four in the eighth, twenty-two in the first week of the ninth month, twenty in the second week, twenty-two in the third week, and eighteen in the fourth week. Eight cases were overdue one week, and five cases were overdue two weeks or more; hence there are thirteen readings in the tenth month of pregnancy.

In analyzing the data in these twenty-seven antepartum cases, pulse pressures were calculated from the systolic and diastolic pressures noted each month, and graphs were made of both these pressures, the pulse pressure, and the pulse rate.

ANTEPARTUM GRAPH

A graph of these cases shows that there is an irregular but gradual rise in each series through pregnancy. During the first two weeks of the tenth month the systolic and diastolic blood pressures and the pulse rate drop slightly, but this may be due to the fact that for these observations data were obtained in only thirteen cases.

The average systolic pressure (Table 1) shows the most uniform curve, gradually rising from 107.1 in the second month of pregnancy to 119.1

during the ninth month, from which point it drops to 118 in the second week of the tenth month of pregnancy. These findings agree with those of Schulze, 1920, who found that the average blood pressure is slightly higher during the latter months of pregnancy; but the average at term which we found to be between 118 and 119 is slightly lower than his observations of 123 in seventy-five cases. It does, however, agree with the findings of Bailey in 1911.

The diastolic pressure (Table 2) is slightly more irregular, yet it gives a gradual rise from 65.4 in the second month of pregnancy to 73.8 during the fourth week of the ninth month, with a subsequent drop in the tenth month in those patients who were overdue. There is, however, a break in this curve, showing a decrease in the diastolic pressure during the fifth and sixth months.

The pulse pressure (Table 3) gives a somewhat different picture, showing a drop from 42 to 41 during the second month of pregnancy, a definite rise from the third to the fifth month, a still greater rise during the seventh month, and then an irregular but gradual fall to the fourth week of the ninth month of pregnancy, after which it again rises in the first week of the tenth month. It can

Table 3
PULSE PRESSURE IN RELATION TO LABOR

Entire Series			Antepartum Group															
			Entepartum						Postpartum									
Time	No. of cases	Range	Average	Mode	Median	Geoth. No. of cases	Range	Average	Mode	Median	Time	No. of cases	Range	Average	Mode	Median		
D L	100	24-80	47.74	50	48	3 m	9	38-56	41.77	36	44	D L	25	36-68	45.58	50	46	
1 h	100	22-84	45.46	44	44	3 m	10	30-54	41.00	42	42	A L	25	30-72	45.76	48	46	
2 h	100	24-72	45.62	40	46	4 m	16	39-67	43.93	36	42	D L	25	30-64	46.32	44	46	
24 h	100	24-70	45.60	40	44	5 m	12	36-54	43.54	44	44	D L	25	30-70	43.92	40	42	
2	4	20-70	45.70	40	40	5 m	12	35-58	46.30	50	46	3	4	20-70	45.70	38	40	
3	10	26-74	44.22	40	44	7 m	21	34-52	47.90	48	48	3	27	32-64	42.22	40	42	
3	10	22-56	43.72	40	42	8 m	24	32-56	45.12	48	46	4	27	30-62	43.77	42	44	
5	10	22-70	42.68	38	42	9 m	22	39-60	47.09	50	46	5	27	30-60	41.44	42	42	
6	10	22-70	42.68	40	44	9 m	20	34-56	46.30	50	46	6	1	27	30-60	41.86	38	40
7	10	22-62	41.05	38	40	9 m	22	34-59	46.27	40	48	7	27	30-60	40.07	40	40	
8	10	24-62	40.84	40	40	9 m	18	34-62	44.11	42	46	8	27	30-54	40.44	38	40	
9	10	22-62	40.20	36	40	10 m	6	42-58	47.00	40	42	9	27	30-64	40.81	36	38	
10	75	20-60	41.84	44	42	10 m	5	44-60	47.20	48	48	10	1	27	32-50	39.86	36	38
11	4	26-58	40.50	40	40	11 m	4	42-58	46.50	40	40	11	24	34-50	39.83	42	40	
12	3	30-50	39.63	36	40							12	3	30-50	37.15	36	40	
13	20	30-48	41.20	44	42							13	4	30-50	40.12	48	40	
14	1	16	38-48	37.60	38							14	1	6	36-46	40.00	38	38
												5	2	27	32-54	41.33	40	
Pre-symptomatic Group						Fitturintr Group						Morphine Group						
D L	5	56-80	65.0	62	62	D L	24	34-62	48.96	42	48	D L	5	42-58	55.80	60	60	
A L	6	52-72	61.0	58	58	A L	24	30-54	48.18	40	46	A L	5	30-46	50.60	36	36	
12 h	6	48-72	59.3	60	60	12 h	24	34-64	45.42	40	42	12 h	5	40-48	48.00	40	40	
24 h	6	38-70	56.0	60	64	24 h	24	24-68	45.99	42	44	24 h	5	36-42	39.20	40	40	
2	3	48-70	60.0	68	68	2	24	32-68	44.19	40	42	2	3	30-44	37.60	38	38	
3	4	50-74	61.3	60	60	3	24	28-58	43.52	40	42	3	3	28-44	36.80	40	40	
5	4	48-56	57.0	56	56													
6	4	40-64	63.3	60	62	Cester oil and Quinine Oroup						D L --- During labor A L --- After labor						
6	3	42-54	55.0	50	60	D L	6	40-65	52.66	52	52	D	4	--- Day				
7	3	38-58	48.3	38	48	A L	6	36-54	36.66	36	36	d	4	--- Day				
8	3	40-58	48.3	44	44	12 h	6	34-54	44.66	44	44	w	4	--- Week				
10	5	42-54	47.6	48	48	24 h	6	32-52	43.00	40	40	m	4	--- Month				
11	5	36-59	47.6	50	60	2	4	30-48	44.00	40	40							
12	2	36-52	45.0	40	40													

be seen from the graph that there is a gradual increase from the second month of pregnancy to term.

As with the other three factors, the pulse rate (Table 4) also shows a gradual increase during

pregnancy from 84 during the second month to 95 or 97 at term.

This graph shows that in the four factors there is a gradual, broken, and irregular increase from the second month of pregnancy to term.

Data obtained during and after labor, as described above on this group of twenty-seven cases, show, as does the graph for the averages on the entire group of 100 cases, a sudden rise during labor and a gradual decrease from that time until six weeks after delivery.

Table 4
PULSE RATE IN RELATION TO LABOR

Entire Series										Antepartum Group									
										Antepartum					Postpartum				
Time	No. of cases	Range	Average	Mode	Median	Quota-tion	Quota-tion	Quota-tion	Quota-tion	Range	Average	Mode	Median	Time	No. of cases	Range	Average	Mode	Median
D L	100	60-130	87.14	90	88	2	m	9	74-100	84.77	80	84	D L	26	65-116	86.00	90	90	90
A L	100	60-120	84.64	86	86	3	m	11	70-106	84.72	100	80	A L	26	67-110	86.11	90	87	87
12 h	100	66-120	86.79	80	80	4	m	16	74-110	86.52	98	88	12 h	26	65-100	80.20	80	80	80
24 h	100	65-128	83.94	80	80	5	m	16	72-112	89.55	100	84	24 h	26	68-100	81.59	80	80	80
2 d	100	60-110	83.41	80	82	6	m	22	72-112	91.81	88	92	2 d	27	60-100	81.69	80	80	80
3 d	100	66-108	84.11	80	82	7	m	21	72-104	96.72	92	92	3 d	27	74-108	84.66	80	84	84
4 d	100	70-110	86.80	86	86	8	m	24	78-112	96.00	96	96	4 d	27	70-106	83.76	86	86	86
5 d	100	67-110	84.48	80	85	9	m	22	84-112	96.80	96	96	5 d	27	70-98	82.56	80	85	85
6 d	100	68-110	87.14	86	86	9	m	20	88-108	96.50	96	96	6 d	27	70-104	84.85	85	85	85
7 d	100	70-116	86.58	80	86	9	m	22	84-120	97.67	96	96	7 d	27	70-95	84.70	80	85	85
8 d	100	68-100	80.36	80	86	9	m	24	80-110	96.72	96	96	8 d	27	70-100	84.44	80	85	85
9 d	90	68-105	86.25	80	86	10	m	8	88-110	96.00	106	96	9 d	27	76-96	83.96	80	82	82
10 d	76	68-110	86.76	80	85	10	m	5	86-120	96.50	96	90	10 d	27	66-100	82.66	80	80	80
11 d	48	70-118	86.02	86	85								11 d	24	70-108	82.12	86	80	80
12 d	34	60-116	86.06	90	86								12 d	19	60-98	81.10	86	80	80
13 d	40	60-116	81.55	86	80								13 d	14	60-90	81.69	86	76	76
14 d	15	65-110	86.46	85	85								14 d	9	65-110	83.77	90	80	80
													5 w	27	72-90	83.16	86		
Pre-eclamptic Group										Pituitrin Group									
O L	A L	12 h	24 h	2 d	3 d	4 d	5 d	6 d	7 d	O L	A L	12 h	24 h	2 d	3 d	4 d	5 d	6 d	7 d
6	70	96	86.0	80	80	80	80	80	80	6	70	96	86.0	80	80	80	80	80	80
7	70	96	83.16	86	86	86	86	86	86	7	70	96	83.16	86	86	86	86	86	86
8	70	96	83.33	80	80	80	80	80	80	8	70	96	83.33	80	80	80	80	80	80
9	70	96	80.83	76	77	77	77	77	77	9	70	96	80.83	76	77	77	77	77	77
10	70	100	83.3	80	80	80	80	80	80	10	70	100	83.3	80	80	80	80	80	80
11	70	96	80.16	90	90	90	90	90	90	11	70	96	80.16	90	90	90	90	90	90
12	70	96	82.00	80	80	80	80	80	80	12	70	96	82.00	80	80	80	80	80	80
13	70	96	86.16	86	86	86	86	86	86	13	70	96	86.16	86	86	86	86	86	86
14	70	96	89.83	86	86	86	86	86	86	14	70	96	89.83	86	86	86	86	86	86
15	70	96	86.83	90	90	90	90	90	90	15	70	96	86.83	90	90	90	90	90	90
16	70	96	86.83	90	90	90	90	90	90	16	70	96	86.83	90	90	90	90	90	90
17	70	96	86.83	90	90	90	90	90	90	17	70	96	86.83	90	90	90	90	90	90
18	70	96	86.83	90	90	90	90	90	90	18	70	96	86.83	90	90	90	90	90	90
19	70	96	86.83	90	90	90	90	90	90	19	70	96	86.83	90	90	90	90	90	90
20	70	96	86.83	90	90	90	90	90	90	20	70	96	86.83	90	90	90	90	90	90
21	70	96	86.83	90	90	90	90	90	90	21	70	96	86.83	90	90	90	90	90	90
22	70	96	86.83	90	90	90	90	90	90	22	70	96	86.83	90	90	90	90	90	90
23	70	96	86.83	90	90	90	90	90	90	23	70	96	86.83	90	90	90	90	90	90
24	70	96	86.83	90	90	90	90	90	90	24	70	96	86.83	90	90	90	90	90	90
25	70	96	86.83	90	90	90	90	90	90	25	70	96	86.83	90	90	90	90	90	90
26	70	96	86.83	90	90	90	90	90	90	26	70	96	86.83	90	90	90	90	90	90
27	70	96	86.83	90	90	90	90	90	90	27	70	96	86.83	90	90	90	90	90	90
28	70	96	86.83	90	90	90	90	90	90	28	70	96	86.83	90	90	90	90	90	90
29	70	96	86.83	90	90	90	90	90	90	29	70	96	86.83	90	90	90	90	90	90
30	70	96	86.83	90	90	90	90	90	90	30	70	96	86.83	90	90	90	90	90	90
31	70	96	86.83	90	90	90	90	90	90	31	70	96	86.83	90	90	90	90	90	90
32	70	96	86.83	90	90	90	90	90	90	32	70	96	86.83	90	90	90	90	90	90
33	70	96	86.83	90	90	90	90	90	90	33	70	96	86.83	90	90	90	90	90	90
34	70	96	86.83	90	90	90	90	90	90	34	70	96	86.83	90	90	90	90	90	90
35	70	96	86.83	90	90	90	90	90	90	35	70	96	86.83	90	90	90	90	90	90
36	70	96	86.83	90	90	90	90	90	90	36	70	96	86.83	90	90	90	90	90	90
37	70	96	86.83	90	90	90	90	90	90	37	70	96	86.83	90	90	90	90	90	90
38	70	96	86.83	90	90	90	90	90	90	38	70	96	86.83	90	90	90	90	90	90
39	70	96	86.83	90	90	90	90	90	90	39	70	96	86.83	90	90	90	90	90	90
40	70	96	86.83	90	90	90	90	90	90	40	70	96	86.83	90	90	90	90	90	90
41	70	96	86.83	90	90	90	90	90	90	41	70	96	86.83	90	90	90	90	90	90
42	70	96	86.83	90	90	90	90	90	90	42	70	96	86.83	90	90	90	90	90	90
43	70	96	86.83	90	90	90	90	90	90	43	70	96	86.83	90	90	90	90	90	90
44	70	96	86.83	90	90	90	90	90	90	44	70	96	86.83	90	90	90	90	90	90
45	70	96	86.83	90	90	90	90	90	90	45	70	96	86.83	90	90	90	90	90	90
46	70	96	86.83	90	90	90	90	90	90	46	70	96	86.83	90	90	90	90	90	90
47	70	96	86.83	90	90	90	90	90	90	47	70	96	86.83	90	90	90	90	90	90
48	70	96	86.83	90	90	90	90	90	90	48	70	96	86.83	90	90	90	90	90	90
49	70	96	86.83	90	90	90	90	90	90	49	70	96	86.83	90	90	90	90	90	90
50	70	96	86.83	90	90	90	90	90	90	50	70	96	86.83	90	90	90	90	90	90
51	70	96	86.83	90	90	90	90	90	90	51	70	96	86.83	90	90	90	90	90	90
52	70	96	86.83	90	90	90	90	90	90	52	70	96	86.83	90	90	90	90	90	90
53	70	96	86.83	90	90	90	90	90	90	53	70	96	86.83	90	90	90	90	90	90
54	70	96	86.83	90	90	90	90	90	90	54	70	96	86.83	90	90	90	90	90	90
55	70	96	86.83	90	90	90	90	90	90	55	70	96	86.83	90	90	90	90	90	90
56	70	96	86.83	90	90	90	90	90	90	56	70	96	86.83	90	90	90	90	90	90
57	70	96	86.83	90	90	90	90	90	90	57	70	96	86.83	90	90	90	90	90	90
58	70	96	86.83	90	90	90	90	90	90	58	70	96	86.83	90	90	90	90	90	90
59	70	96	86.83	90	90	90	90	90	90	59	70	96	86.83	90	90	90	90	90	90
60	70	96	86.83	90	90	90	90	90	90	60	70	96	86.83	90	90	90	90	90	90
61	70	96	86.83	90	90	90	90	90	90	61	70	96	86.83	90	90	90	90	90	90
62	70	96	86.83	90	90	90	90	90	90	62	70	96	86.83	90	90	90	90	90	90
63	70	96	86.83	90	90	90	90	90	90	63	70	96	86.83	90	90	90	90	90	90
64	70	96	86.83	90	90	90	90	90	90	64	70	96	86.83	90	90	90	90	90	90
65	70	96	86.83	90	90	90	90	90	90	65	70	96	86.83	90	90	90	90	90	90
66	70	96	86.83	90	90	90	90	90	90	66	70	96	86.83	90	90	90	90	90	90
67	70	96	86.83	90	90	90	90	90	90	67	7								

be noted: (1) decrease of intra-abdominal pressure; (2) hemorrhage incident to labor; (3) drug administration, and (4) anesthesia during labor. The influence of three of these factors will be taken up later. After the first day postpartum there continues an intermittent decrease in the average systolic pressure to 109.8 on the fourteenth day. Six weeks postpartum reveals a further decrease to 109.

Averages of diastolic blood pressure show a slight fall from 79.8 to 79.5 immediately after delivery and a much more abrupt fall during the balance of the first twenty-four hours postpartum,

weeks after delivery. The general trend is downward.

After an initial fall during the first twelve hours after delivery, the average pulse rate rises and falls until on the fourteenth day postpartum it is 83.8 or 4.2 below its height of 88 during labor. There is an additional fall to 83.1 six weeks after delivery.

FREQUENCY GRAPH—ANTEPARTUM AND POSTPARTUM

The sudden postpartum drop and subsequent gradual decrease of blood pressure is more strikingly presented in frequency curves from the same data (Fig. 2). Such a curve, as in the antepartum

FREQUENCY GRAPHS—GROUP OF 27 PATIENTS
(Ante Partum Data)

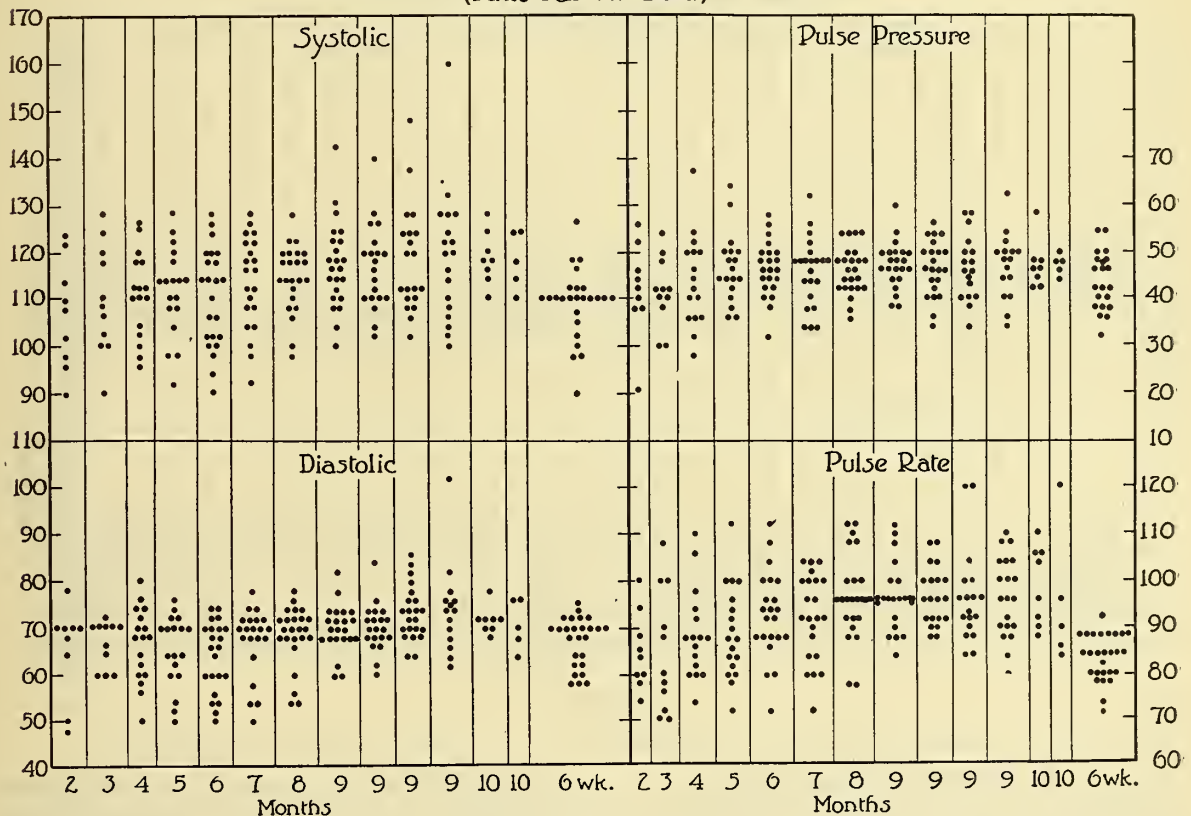


Figure 1

at which time it is found to be 71.2. There is then a short rise, after which it remains fairly level for seven days and gradually falls to 71 on the fourteenth day, and decreases to 66.6 at the end of six weeks postpartum.

The pulse pressure, which is found to be 45.5 during labor, increases to 46.3 twelve hours postpartum and then decreases intermittently to 37.2 on the twelfth day, after which it rises to 41.3 six

observations, substantiates the facts already mentioned and shows that in almost every case the same downward tendency is to be found.

Systolic pressures are found to vary from 90 to 196, whereas the modal or most frequent pressures vary only from 100 to 120. In one case, however, in which there were symptoms of pre-eclamptic toxemia there was a rise in systolic pressure from 168 to 196 during labor, with a drop to 90 six

weeks postpartum. In the same way the modal pressures decreased from 120 to 100 on the thirteenth day postpartum and rose again to 110 on the fourteenth day, which level it maintained until six weeks postpartum. The most frequent systolic modal pressure is found to be 110.

In this graph, as in the antepartum frequency curve, the diastolic pressure exhibits more stable qualities than any of the other factors. The range during labor is from 60 to 104, while fourteen days postpartum it is from 60 to 80; and a further decline is found at six weeks, from 52 to 75. During and after delivery the modal pressure remains at 84. At twelve hours it drops to 80, at twenty-four

modal pulse rates vary from 90 to 80 with no apparent definite scheme.

Thus it has been seen that throughout twenty-seven cases the average modal and extremes of systolic, diastolic, and pulse pressures pass through a period of ascendancy from the second month of pregnancy to term, then record a sudden rise during labor, which decreases markedly immediately following labor, and then gradually decreases until it reaches a practically normal level six weeks postpartum. The pulse rate in general follows the same rule, though its curve is more irregular, intermittently high and low, both as to average and modal characteristics.

FREQUENCY GRAPHS — GROUP OF 27 PATIENTS
(Post Partum Data)

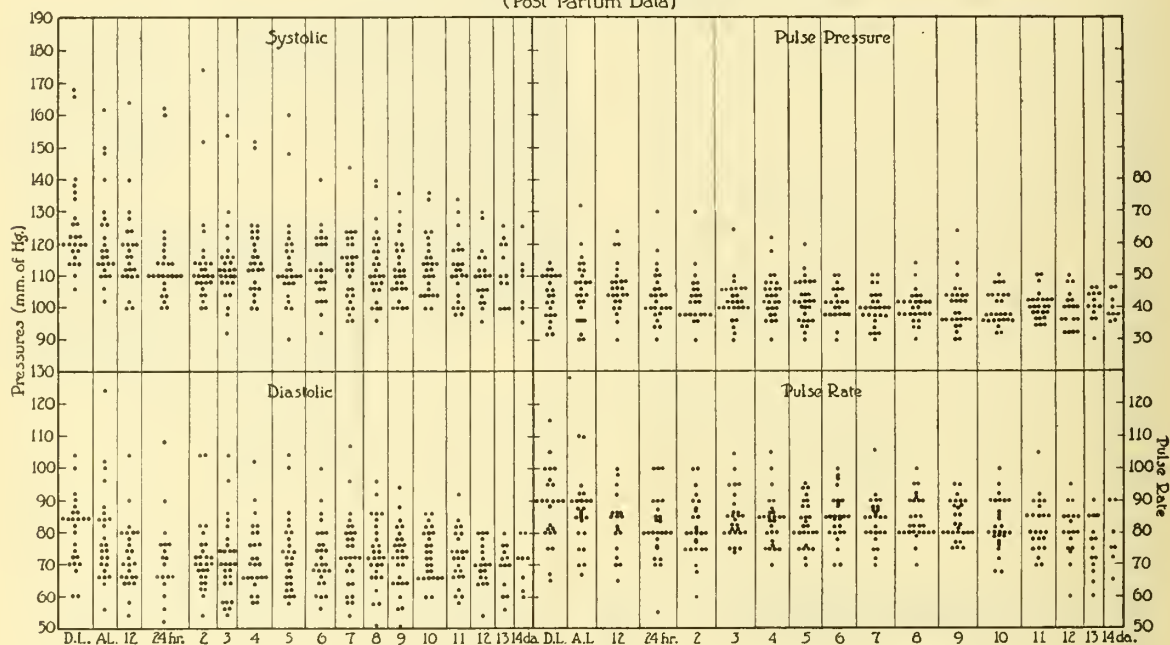


Figure 2

hours to 70, at about which level it fluctuates throughout the balance of the observations.

The pulse pressure and pulse rate are somewhat more variable and their curves more uneven. Pulse pressure shows a range of from 32 to 68 during labor and varies only in the upper extreme, which drops to 54. The modal pressure of this factor is found to be 50 during labor, and it decreases to 36 on the ninth day, but rises again to 42 on the eleventh day. The extremes of the pulse rate vary quite irregularly and maintain a fairly constant level throughout, being 65 to 115 during labor and 65 to 110 on the fourteenth day. The

AVERAGE CURVE—ENTIRE GROUP

Averages of each of the readings above noted were calculated in the original unselected cases and graphs of these averages constructed. Due perhaps to the increased number of cases, a greater uniformity is to be found in the curves so made and, in general, the facts revealed by the smaller series are substantiated.

Danforth states that there is a rise of blood pressure coincident with labor. Schulze states that the average of eighty-six readings in the second stage of labor was found to be 133, and of 104 readings three hours postpartum 120. The present

series bears out these conclusions, though the average of 100 readings is found to be 131.6 instead of 133. Although no readings were taken three hours postpartum, a drop from 131.6 during labor to 126.6 immediately after labor and a further drop to 119.2 twelve hours after delivery indicate that the three-hour reading would practically coincide with Schulze's series. The systolic curve continues its downward trend to 108.9 six weeks after delivery, broken only by a slight rise of eight-tenths of a millimeter on the eleventh day postpartum.

The average diastolic pressure reveals the same steep decline as is noted in the systolic curve dur-

The pulse rate rises and falls as before, seemingly with no definite scheme. Here, however, may be noted a decrease in rate immediately following labor, and a more gradual decrease in the pulse rate level during labor, when it is 87.1, to six weeks postpartum, at which time it is 84.6.

FREQUENCY CURVES, ENTIRE GROUP

Systolic, diastolic, pulse pressure, and pulse rate in each of the 100 cases were plotted for each postpartum reading, and the curves of frequency of the four factors so constructed give further corroboration of the findings previously stated.

Systolic.—Systolic pressures (Fig. 3) range from 78 to 196. There were six patients with

FREQUENCY GRAPHS — GROUP OF 100 PATIENTS

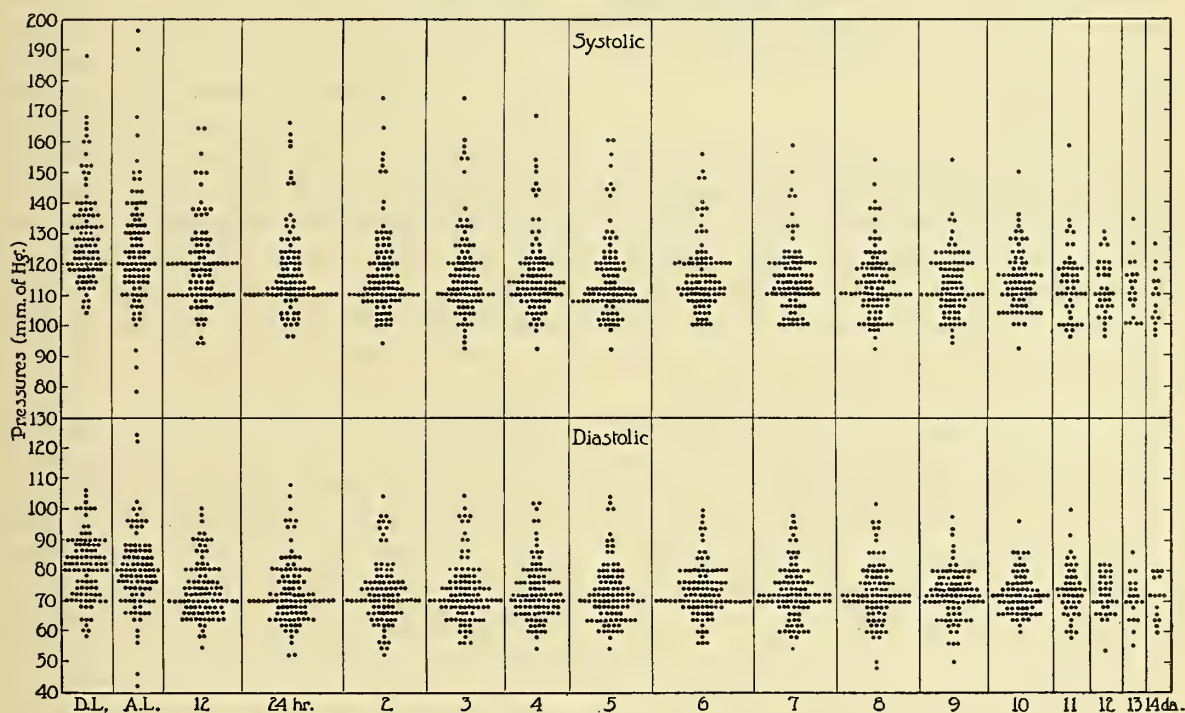


Figure 3

ing the first twenty-four hours after delivery, falling from 81 during labor to 73.4 at the end of twenty-four hours. After the eleventh day it drops to 68 six weeks postpartum.

In the pulse pressure graph the same inclination to drop from the high level during labor to a more normal level is noted. This inclination to drop is much more gradual at first and more irregular from the ninth day to six weeks postpartum than shown in the systolic and diastolic graphs. The average reading during labor is 47.4, while at six weeks it is 41.2.

blood pressures of 160 or over who had albuminuria, edema, and other pre-eclamptic symptoms. The graph of these cases gives a quite different picture, showing a sharp decline immediately and twelve hours after labor, a secondary rise until the third or fourth day, followed by a gradual fall until the fourteenth day. Such also is the type of graph demonstrated by Dr. F. L. Adair in his work on hypertension. Schwartz shows similar curves in hypertension, but the time element differs somewhat from that of the present findings. The case in which a systolic blood pressure of 78 was

recorded is one in which a manual removal of the placenta was done, with a subsequent loss of 1,800 c.c. of blood. The patient was given 1,000 c.c. of normal saline solution intravenously, and the blood pressure began to rise. The range of from 104 to 168 during labor decreased to 96 to 126 at fourteen days. The most frequent pressure throughout all the readings is found to be 110, although during labor, immediately after, and twelve hours after labor 120 claims the majority.

Diastolic.—Diastolic pressures (Fig. 3) decrease from a frequent high level of 80 during and after labor to 70 twelve hours after delivery, which level finds the majority of readings throughout. The lower extreme drops from 58 to 42 immediately after delivery, but then increases to over 50, and only twice reaches 60. The upper extreme, however, exhibits a decline of from 108 to 80 at six weeks postpartum.

Pulse pressure.—In this curve (Fig. 4) it will be found that the lower extreme maintains a fairly uniform height, varying only from 24 during labor to 28 fourteen days afterward, while the upper extreme gradually decreases from 80 to 84 during and immediately after labor to 48 fourteen days postpartum. The modal pressure is seen to drop immediately and twelve hours after delivery to a level of 40, in the region of which it remains.

Pulse rate.—As has been noted previously in the pulse rate, it is not very dependable (Fig. 4). Its extremes vary from 60 to 130 during labor, drop to 60 and 65 to 120 immediately and twelve hours after labor, whereupon the lower extreme drops to 55 and the upper extreme rises to 123, just two points below its original height.

At fourteen days it is seen to be 65 to 110. The modal pulse rate drops from 90 during labor to 85 and 80 immediately and twelve hours after labor. It fluctuates between these two levels until the twelfth day, whereupon it rises to 90, only to return on the thirteenth day to its former level of 85.

During labor hemorrhage, anesthesia, and drug administration are the three factors which, together with decrease of intra-abdominal pressure, most influence blood pressure and pulse rate. An effort has been made to analyze any inter-relation between drug administration and hemorrhage and to demonstrate the effect of drug administration on the blood pressure and pulse rate. It may be noted here that practically every patient in this series was

given nitrous oxide during the actual birth of the child and any effect that it may have had has been shown in the graphs already considered.

In the 100 cases under consideration, thirty-four patients were given drugs prior to or during labor. This group can be subdivided into (1) those patients who were given pituitrin, of whom there are twenty-four; (2) those who were given castor oil and quinine for the induction of labor, six in number, and (3) those who were given morphin and hyoscin, of whom there are five. These groups are of interest not only because of their variation from the general blood pressure curves, but also because of the possible effect of drug administration on the amount of hemorrhage.

In each case the amount of blood lost was measured roughly, and the amount absorbed by sponges and drapes estimated and added to the quantity measured. Throughout the series, including both the drug and non-drug groups, the average loss of blood was 247.44 c.c. For the cases in which drugs were administered, which of necessity include the truly abnormal cases, the average loss of blood was 416.17 c.c. When the two groups are separated, the non-drug group is found to have an average loss of blood of only 157.81 c.c., whereas the average amount of hemorrhage in the drug group is found to be, as stated above, 416.17 c.c.

Classification of the drug group shows that the five patients who were given morphin and hyoscin have the highest average blood loss, 479.16 c.c. This, perhaps, is due to the fact that one of these patients delivered an anencephalic monster and had an abnormal placenta. There was one case of persistent O.D.P. position in which the head was rotated manually and forceps applied. There were two cases of O.L.P. position, in one of which forceps were applied, and in the other a version and extraction performed.

Six patients were given castor oil and quinine. The average loss of blood in this group was 454.16 c.c. The unusual amount of hemorrhage and the high average is due to the fact that a manual removal of the placenta was done in a case in which pituitrin was given besides castor oil and quinine. The blood loss in this one case was 2,000 c.c. If this case were eliminated the average loss for this group would be 145 c.c.

In the remaining cases of the drug group, twenty-four in number, pituitrin was administered either to induce labor, or, in the second stage of

labor, to hasten delivery. Pituitrin was given nine times to induce labor in doses of three to four minims every half hour for five or six doses, or until the pains began; it was given fifteen times in doses varying from two to fifteen minims to hasten delivery. Consequently the average time prior to delivery was fifty-one minutes, whereas in most cases only fifteen to twenty minutes elapsed before delivery. The average amount of blood loss in this group was 356.24 c.c., but in this group there were two cases in which manual extraction of the placenta was done, carrying a loss of blood of 1,800 and 2,000 c.c.

Thus it is seen that those cases in which drugs

sure increases rather than decreases, and the modal pressure remains at practically the same level throughout the three days.

MORPHIN AND HYOSCIN CURVE

Even though the morphin and hyoscin group contains only five cases, its graphs illustrate quite well the unusual amount of hemorrhage and at the same time display the same general characteristics noted in the entire group of 100 cases. Systolic pressure reveals an excessive drop from 132.8 to 113.6 after delivery and a continued decrease through the third day. Diastolic pressure falls from 80 during labor to 69.6 twelve hours after

FREQUENCY GRAPHS—GROUP OF 100 PATIENTS

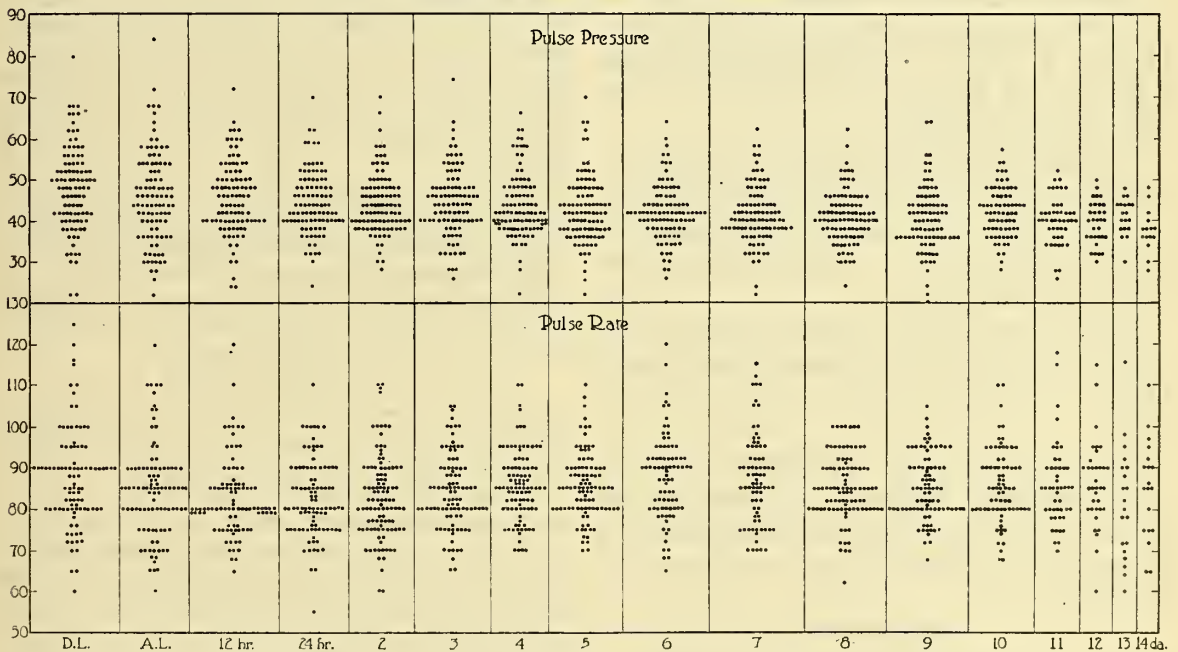


Figure 4

were administered constitute a group which has an average blood loss much above that of the non-drug group. Graphs have been made of the average of the four factors during the first days after delivery.

PITUITRIN GROUP CURVE—AVERAGE

This group of cases in which pituitrin was administered numbers twenty-four. The average blood loss in this group is 356 c.c. or 200 c.c. more than that of the non-drug group.

PITUITRIN GROUP FREQUENCY CURVE

The curve of frequency in this group gives the same picture for systolic pressure and pulse rate, yet it shows that the lower range of diastolic pres-

sure increases rather than decreases, and the modal pressure remains at practically the same level throughout the three days. Pulse pressure shows an initial fall from 52.8 during labor to 37.6 after labor, then rises for ten to twelve hours to 41.6, after which it resumes its downward tendency. The curve of pulse rate shows an initial drop and then an upward trend through the balance of the three days. This rise in the pulse rate is the natural result of hemorrhage.

CONCLUSIONS

From the work presented it is concluded:

1. That there is an irregular but gradual rise in systolic, diastolic, and pulse pressures, and

pulse rate during pregnancy. This is true of both average and modal pressures.

2. That there is a sudden rise of pressures and pulse rate during labor, a marked decrease immediately after delivery, and a gradual decrease from that time until six weeks postpartum, when a normal pressure has been reached.

3. In pre-eclamptic toxemia the blood pressure shows a marked initial decrease after labor, a secondary rise with a subsequent slower and gradual return to its previous or more normal level.

4. That systolic blood pressure shows the greatest range of variability, diastolic the least, while pulse pressure and pulse rate fluctuate more or less but still coincide fairly well with the general tendency of the other factors.

5. That the average blood loss for 100 cases in this series is 247.4 c.c., but that this average falls to 157.8 c.c. if those cases in which drugs were administered are removed.

6. That those cases in which drugs are administered have an average blood loss of 416.2 c.c.

7. That drugs given in the therapeutic doses used in this series do not materially affect blood pressures or pulse rate.

8. That hemorrhage in obstetrical cases is more excessive when drugs are used and is a very important factor in influencing blood pressures and pulse rate.

This paper is the result of a suggestion from, and interest stimulated by, Dr. F. L. Adair, and the routine work has been done by the authors in the Maternity of the Swedish Hospital, Minneapolis, Minnesota.

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DISCUSSION

DR. ADAIR: The way the blood loss was determined in these cases was as follows:

As soon as the child was delivered, a basin was placed against the perineum and all the blood lost was collected in this basin and measured. So far as the blood loss is concerned, I think that was fairly accurate.

In the manual removal of the placenta—one losing 1800 c.c. and the other 2000 c.c.—this includes the amount of blood lost up to the time the placenta was removed. I realize that this is a tremendous amount of blood. I think in both instances the hemorrhage with the third stage of labor was one of the causes for the manual removal of the placenta.

I think the management of the third stage is fairly uniform in the hospital. Essentially, the same technic is used, i.e., merely the expectant management of this stage.

The interesting things to me in the series are—

1. The tendency of the blood pressure to rise during pregnancy so that it attains not only the average pressure but the curve shows an upward tendency.

2. The rather abrupt rise of blood pressure during labor, with a subsequent drop and gradual decline until a normal or usual level is reached about the end of the second week.

3. The difference between the behavior of a normal case without hypertension and the case with hypertension. In cases without any abnormal blood pressure, both the systolic and diastolic drop uniformly, but show no secondary rise. In the others, with hypertension we get the same rise during labor, with a subsequent fall, then a secondary rise and a secondary fall.

I am not certain that the use of drugs should be taken as the reason for the large amount of blood loss in these cases. Many of these cases were cases of prolonged labor, cases which had gone overtime, etc. Various factors enter into this loss, so I hardly think it is fair to attribute the greater blood loss solely to the administration of drugs.

DR. SWEETSER: How high was the highest systolic pressure?

DR. ADAIR: 196.

DR. SIMONS: I might add that in one of the cases in which manual extraction of the placenta was done, the extraction was done for hemorrhage. The woman went into shock; her systolic dropped to 78 and the diastolic to 46. She was given intravenous injections of saline. In the other case pressure was exerted, expression was done, and eversion of the uterus resulted. These are the two cases in which blood loss was greatest.

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION,
SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN
MINNESOTA MEDICAL ASSOCIATION, AND MINNEAPOLIS SURGICAL SOCIETY

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its

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The rate for classified advertising is five cents per word with a minimum charge of \$1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VIII

MAY, 1925

No. 5

EDITORIAL

Mercurochrome, Gentian Violet, and Hexyl-Resorcinol as Antiseptics

Widespread, exaggerated statements of the value of recent antiseptic compounds have appeared in the daily newspapers throughout the country. As a result of this unfortunate notoriety, not only the public, but apparently the medical profession as well, have been led to believe that the cure for sepsis has finally been discovered. Unfortunately, this much desired goal has not as yet been reached. As a result of this publicity and the enthusiastic case reports in medical journals, physicians otherwise conservative and well balanced are using a considerable assortment of antiseptic solutions intravenously for a variety of diseases. This is particularly applicable to the intravenous use of mercurochrome.

Although the Council on Pharmacology officially recognizes the value of mercurochrome as a local germicide, it has not as yet made any statement with regard to its efficacy when used intravenously or internally. It has not even been determined whether

its effect is specific as an antiseptic, or indirect as the result of protein reaction. In the meantime, many physicians have blindly used this powerful antiseptic solution intravenously without any scientific guidance or precautions. Exaggerated statements have been circulated as to the wonderful recoveries that result from its use. The rather overwhelming number of failures, the violent reactions, the ill results and the occasional fatalities are not so well known. Severe reactions are frequently observed after the intravenous use of mercurochrome, marked by prostration, chills and dysentery. Hensch, Snell and Greene in the Mayo Clinic have noted definite acidosis in several cases. Several deaths have followed its use, and probably more have occurred than are not reported.

Clinical experience has proved that mercurochrome administered intravenously is of the greatest value in acute and subacute infections of the urinary tract. Since this type of infection, however, usually responds to the ordinary medication, intravenous chemotherapy should be reserved for such cases as do not respond. Recovery has been observed in a few forms of acute disease of the skin following the intravenous injection of mercurochrome, but its exact value remains questionable. In chronic general infections, such as arthritis, pelvic infections, and so forth, it is rarely of much value. In fact, in most general infections involving the various portions of the body, its use has been disappointing. Only in the occasional case of acute general sepsis has it achieved good results. It is true that in these occasional cases recovery is sometimes miraculous, but the number of such is so small, and the attendant danger so great, that the method should be employed only as a last resort.

The intravenous use of gentian violet has been advanced for infections when a staphylococcus is found in the blood cultures. The reactions following its use are comparatively slight, so that it may be employed with less risk than mercurochrome. The results, however, have been similarly limited. In septic endocarditis, which should afford particularly favorable conditions for its use, it has been most disappointing. Staphylococcus cellulitis is hindered only occasionally. In a few cases of general sepsis, caused by staphylococcus, brilliant results have been attained.

Hexyl-resorcinol, a more recent germicide, has similarly experienced unfortunate newspaper notoriety. Sincere efforts were made to prevent any

general use of this drug until it was fully tested. In spite of this, it was hailed in the press as a miraculous cure for all forms of urinary infection. Those who have used it are much more conservative in their expressions. In some few cases of chronic staphylococcus infection it has proved to be useful in conjunction with other measures. However, it has not succeeded in supplanting, to any great degree, the more standardized methods.

Chemotherapy, and particularly the intravenous, would seem to have a promising future. Our present products are comparatively crude, but our methods will undoubtedly be improved. Until they are, it behooves the conservative physician to employ chemotherapy only in selected cases, and to safeguard the administration with every precaution.

W. F. BRAASCH.

The Legislative Committee

Some of our profession hold that our organization should adopt an attitude of "laissez faire" regarding legislation affecting public health. They say, "Let the public have what they want and if they do not know what is good for them let them suffer."

Others believe that in a government of, for and by the people, each component element of society has a certain duty to perform by helping to direct legislation. Our legislators are not men professionally trained in legislation but are for the most part practical, honest and reasonable men drawn from various walks of life. In case of doubt as to the advisability of a proposed measure they are most likely to vote "no." This is as it should be and radical departure from established precedent is least likely. The legislator, therefore, has to be instructed by those interested and best informed before he can intelligently pass on proposed measures.

The experience of our state legislative committee has been quite unique for Minnesota at least. A bill sponsored by the physicians of the state has been enacted. The statute of limitations for malpractice cases has been reduced from six to two years. The committee found that it was simply a question of convincing the legislators of the justice of the bill and that personal contact was absolutely essential. Some call such methods lobbying and think it undignified. There is no reason why per-

sonal persuasion in the form of lobbying need be objectionable.

Most of the energy of the committee was exerted in blocking proposed medical bills which were ill-advised to say the least. One bill, which fortunately was not acted upon by this legislature, provided in brief that any city hospital patient might choose his medical attendant irrespective of school or cult; at first thought a very reasonable provision for a citizen of a free country. It is interesting to speculate how such a measure would have affected hospital administration. A staff would lose its identity as such. A diphtheria patient might well ask to have a chiropractor manipulate his spine to correct the impingement causing the sore throat. Or one with an abscessed appendix might elect absent treatment by a Christian Scientist. Just as reasonable in hospital as out of hospital. Perhaps the best argument against such a bill is that city hospitals in Minnesota having staffs so composed would lose their standing in the list approved for internship by the medical colleges and state boards and would thus be able to get no internes from the best medical schools and perhaps none at all. The bill made little progress.

Among other unwise bills blocked at the recent legislature were the following:

A bill authorizing nurses receiving their training in hospitals for the insane to practice psychiatric and general nursing after examination by the Board of Control. The word "general" killed the proposition.

A bill to prevent full time employees of the State University or other State institutions from engaging in any outside activities under penalty of fine and dismissal.

A bill to prevent the building of any contagious hospital within fifteen hundred feet of any public park.

A bill authorizing the appointment of a Board of Examiners for Naturopaths.

A chiropractic bill lowering the requirements for the practice of chiropractic in the State. The chiropractors killed this bill themselves.

Anti-vivisection and anti-vaccination bills. The one track minds which compose these antis are most persistent.

For some time the masseurs have been endeavoring to obtain a Board of Examiners. A bill provid-

ing for the creation of such a Board is at present writing before the legislature. There seems to be no good reason why such a board should not be created.

The State Association has been most fortunate in having a legislative committee this year which obtained results. This was particularly due to the activities of Dr. H. M. Johnson, of Dawson, who gave unsparingly of his time and energy and is particularly gifted for work of this sort. The Association would be most fortunate if it should be able to retain his services indefinitely. Just as important medical legislation is likely to arise in the next legislature and we as a profession must prepare to meet it.

COMMUNICATIONS

Duluth, Minnesota, April 11, 1925.

HYPERTHYROIDISM IN NORTHERN MINNESOTA

What is to be the ultimate influence of the indiscriminate use of iodine, so largely taken now by many people, either in the form of Nu-Salt, Lugol's solution, iodine tablets, or, even more definitely, from the drinking of public water supplies to which iodine has been added?

This is becoming more than an academic question, in view of the rather striking number of people who have presented themselves, especially in the last two months, with outspoken signs of thyroid toxicity.

The first impulse is to call this goiter toxicity, but many of these patients seen have had no apparent goiter, and in many instances the thyroid can scarcely be felt.

Nevertheless, the train of symptoms, including weight loss, tremor, nervousness, tachycardia, skin flushing, have all been so outspoken as to incriminate the thyroid at once.

These patients are showing basal metabolic readings of +50, and often as high as +85.

The region of Virginia and Gilbert, Minn., where the public water supply is treated with iodine, has contributed enough of these patients so that it can be scarcely said any longer to be mere chance. These patients are coming from other regions, but in practically every one it will be found that they had been using iodized salt for some time. A number of them present the story of recent infections—but, we have these infections every winter, of exactly the same sort, and yet, this is the first time that this thyroid toxicity picture has presented itself so vividly and in such numbers.

This is written in the hope that others will express themselves on this subject. Are we sure that some people may not be disturbed by even the small amount of iodine taken in the manner here indicated? Granted that the natural supply of water along the seacoast has as much iodine as is artificially introduced into some of our supplies, does it follow that both will act the same or that a people in an iodine-low locality (long residents) can be arbitrarily grouped without bringing into the foreground some notably susceptible individuals?

E. L. TUOHY.

OBITUARY

DR. EDWARD EVERETT HOIT

Dr. Edward Everett Hoit, a pioneer physician of Detroit, Minnesota, died at his home Saturday, April 4, 1925, following an apoplectic stroke, which he had suffered three weeks previously.

Edward Everett Hoit was born at Auburn, Maine, September 3, 1852, the son of James Russell Hoit and Abbie Rea Hoit. The family moved to Minneapolis in 1869. He entered Ann Arbor, Mich., Medical College, where he graduated in 1878, after which he began the practice of medicine in Minneapolis, and came to Detroit, where he permanently located in the summer of 1880. Soon after this he took a course of lectures at Bellevue Medical College, New York, and later, still pursuing his studies, entered Rush Medical College, Chicago, where he graduated in 1885.

October 24, 1889, he married Della B. Day, of Detroit. One daughter, Lucille, now Mrs. J. K. McCarthy, was born to them. Mrs. Hoit, her mother Mrs. Day, Mr. and Mrs. McCarthy and one granddaughter, Corice McCarthy, are the sole survivors of the family, the doctor's only brother having recently died in Minneapolis.

For many years Dr. Hoit served as county physician. He was a member of the Odd Fellows Lodge, also of the lodges of Yeomen and the Red Men.

The esteem in which Dr. Hoit was held in his own community is well portrayed in the following excerpt taken from a home paper:

"Dr. Edward Everett Hoit came to Detroit in the summer of 1880—forty-five years ago—and during all of the intervening years he devoted his life to the promotion of the health and happiness of the people among whom he lived. A most worthy purpose—a course that may be said to have been well run, and finished beyond the allotted time of three-score years and ten.

As a physician and surgeon Dr. Hoit earned and won more than a local reputation as a successful practitioner. He enjoyed the confidence and the friendship of those whom he served in time of need. Coming here a young man just recently graduated and prepared for his life work, for nearly half a century he has carried on, and now at the age of seventy-three years he has passed to his reward.

Dr. Hoit will be greatly missed in this community, for his ready smile of greeting, his always apt and ready story, his cheerful outlook upon life's duties were recognized and won for him many lasting friendships."

DR. CHARLES CLIFFORD MAY

News of the death of Dr. Charles Clifford May of Adrian, which occurred March 15, 1925, as the result of a self-inflicted bullet wound, came as a shock to members of the community in which Dr. May lived and to members of his profession.

According to the report of his death published in an Adrian paper "Dr. May had an active mind, was a deep

thinker, and well read on the topics of the day. He always took a great interest in our schools and a number of years ago was a member of the school board. He was an active member of the local Masonic Chapter and the Masonic Chapter at Worthington.

"He was highly respected by all and his manner of passing is deeply regretted by the entire community."

Charles Clifford May was born at LeClaire, Iowa, on March 8, 1860. About the year 1886 he came to Adrian, where he began his profession, and where for the past thirty-nine years he had been one of the prominent physicians. In the year 1891 he was married to Miss Carrie Johnson, then a teacher in the Adrian public schools. He was a graduate of the University of Iowa, the New York Polyclinic of New York City, and the Chicago Polyclinic at Chicago. He was also a member of the Southwestern Minnesota Medical Association, the Minnesota State Medical Association and the American Medical Association.

The deceased is survived by his wife and three children. The children are Darwin R., of Indianapolis, Ind.; Mrs. C. M. Anderson (Lillian), of Estherville, Iowa, and James A., of Minneapolis.

DR. GEORGE H. GREEN

Dr. George H. Green, of Spokane, Washington, was killed recently in an automobile accident. He suffered a fractured skull when the automobile in which he was riding was hit by a speeding car at a street intersection.

Dr. Green spent his boyhood in St. Peter, Minnesota, and graduated in medicine at the University of Minnesota in 1904. He first located at Reardon, Washington, where he practiced until about two years ago. Going East, he took postgraduate study in surgery and had been associated the past year with Dr. D. C. Hewitt in Spokane.

Dr. Green is survived by his mother, Mrs. Charlotte Green, now of Los Angeles, three brothers and a sister.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Officers: President, Dr. H. W. Meyerding, Rochester; First Vice-President, Dr. F. R. Huxley, Faribault; Second Vice-President, Dr. J. S. Holbrook, Mankato; Secretary-Treasurer, Dr. H. T. McGuigan, Red Wing; Chairman of Program Committee, Dr. Waltman Walters, Rochester.

The annual meeting of the S. M. M. A. will be a one-day meeting, May 18th, at Owatonna. Scientific presentations will be given morning, afternoon and evening. The presidential address by Dr. H. W. Meyerding of Rochester on the history of the Association will be given at the evening meeting. The following program has been arranged:

MORNING SESSION

- I. "Use of Radium Seeds in Malignant Tumors of the Head and Neck," Dr. F. A. Figi, Rochester.

II. SYMPOSIUM ON ABDOMINAL DISEASES

1. "Consideration of Diagnosis of Chronic Abdominal Disease," Dr. D. M. Berkman, Rochester.
2. "Clinical Diagnosis and Treatment of Diseases of the Gall Bladder," Dr. Wm. Carroll, St. Paul.
3. "The X-ray Diagnosis of Gall Bladder Lesions," Dr. C. G. Sutherland, Rochester.
4. "A Mistaken Diagnosis of Appendicitis," Dr. B. J. Gallagher, Waseca. Discussion, Dr. J. F. Smersh, Owatonna.
5. "Perforated Gastric and Duodenal Ulcers," Dr. J. S. Holbrook, Mankato.
6. "Arterioesenterial Ileus," Dr. E. M. McLaughlin, Winona.

- III. "Abdominal Injuries and Their Treatment," Dr. Karl Meyers, Chief Surgeon, Cook County Hospital, Chicago.

- IV. "Heart Pains—Various Types and Clinical Differentiation," Dr. C. N. Hensel, St. Paul. Discussion, Dr. F. A. Willis, Rochester.

- V. "The Management of Cases of Colloid Goiter," Dr. H. C. Habein, Rochester. Discussion, Dr. W. A. Plummer, Rochester.

- VI. "Pathological Findings in 200 Cases of Primary Hypertension," Dr. E. T. Bell, Professor of Pathology, University of Minnesota, Minneapolis.

LUNCHEON

AFTERNOON SESSION

I. SYMPOSIUM OF CONFINEMENT AND THE NEW-BORN

1. "Hemorrhagic Diseases of the New-Born with Importance of Bleeding and Coagulation Time," Dr. Margaret Warwick, Assistant Professor of Pathology, University of Minnesota, Minneapolis. Discussion, Dr. Roger Kennedy, Rochester, and Dr. O. Grob, Rochester.
2. "Observations on Dry Labor," Dr. L. M. Randall, Rochester. Discussion, Dr. L. W. Barry, Assistant Professor, Obstetrics and Gynecology, University of Minnesota, St. Paul.
3. "Abruptio Placentæ," Dr. J. A. Cosgriff, Mankato. Discussion, Dr. Roy Andrews, Mankato.

- II. "Urinary Antisepsis—the Present Status of the Problem," Dr. Edwin Davis, Professor of Urology, University of Nebraska, Omaha. Discussion, Dr. G. J. Thomas, Minneapolis; Dr. F. E. B. Foley, St. Paul; Dr. J. L. Crenshaw, Rochester.

- III. "Recent Advances in the Treatment of Syphilis," Dr. W. H. Goeckerman, Rochester. Discussion, Dr. H. Irvine, Minneapolis.

- IV. "Traumatic Injuries of the Hand," Dr. C. W. Hopkins, Chief Surgeon, Chicago & Northwestern Ry. Co., Chicago.

- V. "Treatment of Empyema from Its Onset," Dr. S. W. Harrington, Rochester.

EVENING SESSION

BUSINESS MEETING—BANQUET

- I. Presidential Address, Dr. H. W. Meyerding, Rochester.
- II. Subject to be chosen—Hon. W. I. Nolan, Lieutenant Governor of Minnesota.
- III. Dr. D. C. Balfour, Professor of Surgery, Mayo Foundation, Rochester.
Moving Pictures at Evening Session.
 1. "Pathology and Treatment of Pulmonary Tuberculosis," Dr. Cole's film loaned through the kindness of Dr. Longstreet Taylor, St. Paul.
 2. "The Mechanism of Swallowing in Cardio-Spasm," Dr. P. P. Vinson, Rochester.

LYMANHURST STAFF MEETING

The regular meeting of the medical staff of the Lymanhurst School for Tuberculous Children will be held in the Lymanhurst School, 1800 Chicago Avenue, Minneapolis, Tuesday evening, April 21, at 7 o'clock.

The following program will be given:

"*Tuberculous Empyema*," Dr. Willis S. Lemon, Mayo Clinic, Rochester, Minnesota.

Fourth Annual Report of Lymanhurst:

Short addresses by:

Dr. E. P. Lyon, Dean of Medical School, University of Minnesota.

Dr. S. Marx White, Chief of Department of Medicine, University of Minnesota.

Dr. C. M. Jackson, Dean of Graduate School, University of Minnesota.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

AMERICAN PROCTOLOGIC SOCIETY

The American Proctologic Society will hold its annual meeting at the Ambassador Hotel, Atlantic City, May 25 and 26, 1925, at the time of the American Medical Association meeting. The program includes a paper on Sacral Anesthesia by Dr. L. A. Buie, Rochester, Minn., and one on the Probable Relation of Ano-rectal Fistulae to Tuberculosis by Dr. W. A. Fansler, Minneapolis.

Those interested in this field of medicine are invited to attend the meeting of the society.

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

The Southwestern Minnesota Medical Society will hold its next meeting at Windom, Minnesota, May 21, 1925. Dr. E. M. Hammes, St. Paul, and Dr. H. M. Johnson, Dawson, will be among the speakers appearing on the program.

OF GENERAL INTEREST

Dr. Morris H. Nathanson is now associated with Dr. Moses Barron in the practice of internal medicine at 309 Physicians and Surgeons Bldg., Minneapolis, Minn.

The South Dakota State Medical Association will hold its next annual meeting at the Cataract Hotel, Sioux Falls, South Dakota, Wednesday and Thursday, May 20 and 21, 1925.

Dr. W. E. H. Morse has disposed of his practice at Morristown and is now located at Altura, Minnesota, where he will continue the practice of his profession and will conduct a drug store.

Dr. A. C. Strachauer, chief of the Department of Surgery at the University of Minnesota, has resigned that position to become director of the new George Chase Christian Cancer Institute at the University.

The resignations of Dr. F. W. Wittich, assistant professor of Medicine, and Dr. C. M. Cleveland, teaching fellow in obstetrics, and Dr. C. H. Osborne, teaching fellow in anatomy, have been accepted by the school.

Nineteen women entered the School of Nursing at the University of Minnesota, at the beginning of the new quarter in April, and are enrolled in both the five year and three year courses. Only one student graduated from the school at the end of the last quarter.

The next examination conducted by the American Board of Otolaryngology will be held at the Ambassador Hotel, Atlantic City, on Tuesday, May 26, 1925, at 9 A. M. Application blanks may be obtained from Dr. H. W. Loeb, secretary, 1402 South Grand Boulevard, St. Louis, Missouri.

If present plans mature, approximately 1,000 University of Minnesota seniors will receive diplomas in June at the first open air commencement exercises ever held at the institution. The regents acted favorably on a report of the functions committee recommending that commencement exercises be held in the new Memorial Stadium.

Minnesota will follow the example of other institutions by issuing two kinds of tickets, one for the Stadium, of which an unlimited number can be issued, and one admitting to the Armory, to which the exercises will be moved in case of rain. Parents and immediate relatives will be given the preference in distribution of the Armory tickets.

The Minnesota State Conference of Social Work will hold its annual session September 19 to 25, 1925, at the State College of Agriculture, St. Anthony Park, St. Paul. The Institute will be held in connection with the Conference. Speakers of national reputation will receive special emphasis. All individuals interested or engaged in social work are invited to attend the meeting.

The University of Minnesota has obtained a conditional gift of \$1,250,000.00 from the General Education Fund of the Rockefeller Foundation for the development of the Medical School. The University must raise an additional

sum of \$2,350,000.00 in order to take advantage of this gift. In considering ways and means of raising this rather large sum, permission was obtained to apply the cost of a new Minneapolis City Hospital to the additional amount to be raised. A free site for the proposed new city hospital has been offered the city of Minneapolis but the Mayor's committee has voted against the proposition, mainly on the grounds of the prohibitive cost of a new institution. Minneapolis has at present a large general hospital which would have to be duplicated under the proposed plan. The committee has recommended the purchase of the Judd block for \$275,000.00 for future expansion of the present hospital.

THE A. M. A. LIST OF APPROVED HOSPITALS

The American Medical Association, through its Council on Medical Education and Hospitals, which handles the hospital work for the Association, has issued its 1925 revised list of Hospitals Approved for Internships. The list is published in *The Journal of the American Medical Association* for March 28. It will also appear in the Ninth Edition of the *American Medical Directory*, besides being in separate pamphlet form. The list names 524 hospitals that are in position to furnish general internships, such as satisfy the medical colleges and state boards as well as meet the almost universal demand of medical graduates for at least a year's general hospital experience, practice or specialization.

There were reported 5,059 interns of whom 3,825 are in the 524 approved hospitals, and 1,234 interns in 2,696 non-approved hospitals. This total of 5,059 interns compares favorably with the 3,669 interns reported in the census of one year ago, the increase being 1,390, or 37.9 per cent. In fact, there are 156 more interns now in approved hospitals than there were in all hospitals two years ago.

When the hospitals began to feel the shortage of interns about a decade ago, they quite naturally resorted to pecuniary appeals and offered salaries, usually ranging from \$25 to \$100 per month and maintenance. Now the appeal must be made on the basis of educational opportunities offered, rather than financial remuneration. There are still a number of hospitals that pay their interns,—and there can be no objection to giving interns some financial help, but hospitals which secure the best interns and most easily are those whose staffs are known to furnish the best educational opportunities, salary or no salary. The Council on Medical Education and Hospitals also publishes a list of the hospitals that provide approved residencies in specialties for those who have already had a general internship or experience.

By furnishing these lists the Council serves not only those who are seeking an internship or residency, it also contributes much to the good of the profession and the public by encouraging a broad general foundation, both for general practice and for specialization.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

ABBOTT LABORATORIES:

Butesin Picrate Dusting Powder

ELI LILLY AND CO.:

Iletin (Insulin-Lilly) U-80, 10 c.c.

H. K. MULFORD CO.:

Rabies Vaccine (Phenol Killed)-Mulford

PARKE, DAVIS AND CO.:

Desiccated Parathyroid Gland-P., D. and Co.

Cauliflower Protein Extract Diagnostic-P., D. and Co.

Lentil Protein Extract Diagnostic-P., D. and Co.

Friedlander Bacillus Protein Extract Diagnostic-P., D. and Co.

Micrococcus Tetragenus Protein Extract Diagnostic-P., D. and Co.

Streptococcus Hemolytic Protein Extract Diagnostic-P., D. and Co.

Streptococcus Non-Hemolytic Protein Extract Diagnostic-P., D. and Co.

Parathyroid A Protein Extract Diagnostic-P., D. and Co.

Parathyroid B Protein Extract Diagnostic-P., D. and Co.

Pine Pollen Protein Extract Diagnostic-P., D. and Co.

Apricot Protein Extract Diagnostic-P., D. and Co.

Yellow Daisy Pollen Protein Diagnostic-P., D. and Co.

Ox-Eye Daisy Pollen Protein Diagnostic-P., D. and Co.

Oak Pollen Protein Extracts Diagnostic-P., D. and Co.

E. R. SQUIBB AND SONS:

Insulin-Squibb, 40 Units, 5 c.c.

Bean (Kidney) Allergens-Squibb

Cauliflower Allergens-Squibb

Frog's Legs Allergens-Squibb

Daisy Pollen Allergens-Squibb

Bacillus Acne Allergens-Squibb

Bacillus Friedlander Allergens-Squibb

SWAN-MYERS CO.:

Timothy Pollen Extract-Swan-Myers

Tuberculin Intracutaneous (Human Type).—A preparation of tuberculin-Koch (New and Non-official Remedies, 1924, p. 309) marketed in single packages of one intradermal syringe containing 0.00005 c.c. of tuberculin old "O. T."; in packages of five intradermal syringes each containing 0.00005 c.c. of tuberculin old "O. T." and in single vial packages containing tuberculin old "O. T." sufficient for fifty tests. H. K. Mulford Co., Philadelphia.

Squibb's Liquid Petrolatum with Agar.—A mixture composed of liquid petrolatum-Squibb—heavy (California) 50 c.c.; agar 1.5 Gm.; sodium benzoate, 0.1 Gm.; acacia, glycerin and water sufficient to make 100 c.c. Squibb's liquid petrolatum with agar has the action of liquid petrolatum. It is claimed that the agar by adding bland bulk to the bowel contents, stimulates peristalsis in a normal way and that the combination of liquid petrolatum with agar mixes readily with the feces and softens them. E. R. Squibb and Sons, New York.

Mercurosal Ampules 0.1 Gm.—Each ampule contains mer-

curosal (New and Non-official Remedies, 1924, p. 207) 0.1 Gm. in 5 c.c. of distilled water containing 0.1 per cent of sodium citrate. Parke, Davis and Co., Detroit. (Jour. A. M. A., Mar. 7, 1925, p. 751.)

Tryparsamide.—Sodium N-phenylglycinamide-p-arsionate. Tryparsamide contains 24.6 per cent of arsenic in organic combination. Tryparsamide is primarily a trypanocidal agent and is proposed for use in the treatment of certain forms of trypanosomiasis. Tryparsamide has some spirocheticidal activity and has an unusual power of therapeutic penetration, especially in the case of the central nervous system. This has led to its trial in certain cases of cerebrospinal syphilis. The value of the drug in these conditions, as compared with other methods of treatment, has not been conclusively determined. Tabetic affections have responded less satisfactorily, and patients with general paresis with advanced physical and mental deterioration have shown little or no improvement and the drug may hasten the progress of the disease in such cases. Its use is considered to be contraindicated in forms of syphilis other than that of the central nervous system. The worst of the properties of the drug is a tendency to produce amblyopia. Before using the drug, consideration should be given to the frequent production of visual injury. Tryparsamide may be administered subcutaneously, intramuscularly or intravenously. Powers-Weightman-Rosengarten Co., Philadelphia. Jour. A. M. A., Mar. 14, 1925, p. 815.)

Insulin-Squibb 40 Units.—5 c.c. vials containing 40 units of insulin-Squibb (The Journal, A. M. A., Nov. 8, 1924, p. 1509) in each c.c. E. R. Squibb and Sons, New York.

Rabies Vaccine (Phenol Killed)-Mulford.—The virus is prepared according to the general method of David Semple. It consists of a sterile suspension of the brain tissue of rabbits moribund from the injection of virulent fixed strain of rabies. The virus is killed by the use of phenol and by incubation at 37.5 C. for twenty-four hours. Marketed in packages of 14 doses, each dose contained in a syringe. All the doses are of the same potency. H. K. Mulford Co., Philadelphia. (Jour. A. M. A., Mar. 21, 1925, p. 893.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

MEETING OF MARCH 11, 1925

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, March 11, 1925, at 8 p. m. The meeting was called to order by the President, Dr. H. P. Ritchie. There were 34 members present.

The minutes of the February meeting were read and approved.

DR. S. E. SWEITZER (Minneapolis) reported two cases and showed lantern slides.

1. Hypernephroma of scalp. T. W., age 50, male, white. Patient presents himself with pain in his right hip region of duration of four months. Multiple tumors, firm, involving the skin only, not being attached to the bony tissues beneath. Tumors present on scalp, back, chest, and abdomen. Duration of thirteen months. On October 17, 1912,

patient had right kidney removed by Dr. Will Mayo. Diagnosis: Hypernephroma.

On September 16, 1924, patient shows metastases to the left humerus, confirmed by x-ray. Amputation near the shoulder was performed September 22, by Dr. Eitel.

Biopsy of scalp tumor—Hypernephroma structure on section "microscopic." Laboratory findings: Urine, negative. Blood counts normal. Wassermann, negative.

2. Serpiginous syphilid. C. G., age 62, male, white. Presents himself with the following complaints: orthopnea, duration six weeks; cough, duration six weeks; pain in lower chest on both sides; large inguinal hernia, duration forty years; urinary frequency, urgency, and nocturia of several years' duration. Skin lesions on legs, arms and scattered about on trunk of body. The lesions present the picture of serpiginous syphilids.

Patient denies history of infection. States he has never had any primary lesion of syphilis. Patient has never had any anti-luetic treatment.

Laboratory findings: Wassermann was negative on one occasion. Salvarsan was given intravenously. A Wassermann was taken four days later and a four plus (cholesterin, alcoholic antigen) Wassermann was secured.

DR. A. N. COLLINS (Duluth) reported the following case: I wish to present the report of a case of thromboangiitis-obliterans which came under my observation. A young Russian, 35 years of age, not of Jewish descent. When I first saw him, about six months ago, he had gangrene of the small toe of the right foot. No pulse could be felt in the foot. Urine and blood chemistry were negative for sugar. X-ray of the foot was negative for blood vessels but showed some atrophy in the peripheral bones of the foot. Many Wassermans were all negative. The pathology of this condition is a deposit in the wall of the blood vessels—the main vessels rather than the small arteries. The gradual increase of this deposit in the walls closes the lumen and starvation of the extremity results in gangrene.

The patient first had an amputation just above the ankle, against my advice. I thought it should be higher, but he would accede to it only above the ankle; but finally, several months later, we amputated above the right knee. Dr. Gordon MacRae immediately took the amputated part, washed out and injected the circulation with a carefully prepared barium mixture. (Photograph shown.) This is a print of one of the stereo films taken. You will see the ragged narrowing in various places along the main artery from the popliteal space down to the extreme end of the amputated tibia. The arterial branches do not seem to be involved.

DR. GUSTAV SCHWYZER (Minneapolis) presented the following case:

The tumor which I am showing you here is the right kidney of a man 63 years old. The history states that the man had a little blood in his urine from time to time but suffered no pain or discomfort. About a year ago a physician was called on account of retention of urine. At that time there was no blood by the catheterization. The prostate was found enlarged. The hematuria became more frequent of late and the patient sought medical help. The

diagnosis of nephroma of the right kidney was made by Dr. Owre, who cystoscoped and made a pyelogram. My part in the case was to perform the removal of the tumor. This act proved to be very difficult on account of the fixation of the tumor onto the diaphragm. The patient made a speedy recovery though, and is ready to leave the hospital.

DISCUSSION

DR. OWRE: I was called in consultation, to cystoscope this case for Dr. Nordland, for the purpose of ascertaining the possibility of a growth in the bladder. The patient had an enlarged prostate and gave the history of blood in the urine on several occasions during the past four years. Dr. Nordland stated that the patient had called a physician to his home to relieve him of retention of urine.

Upon cystoscopic examination, the bladder was found to be trabeculated, the prostate enlarged, but the mucosa showed no evidence of inflammation or tumor. There was about 4 ounces of bloody residual urine. Blood could be seen spurting from the right ureteral meatus.

The x-ray showed no evidence of stone. A pyelogram showed the pelvis of the kidney to be entirely distorted, with no normal calices; a typical pyelogram of nephroma. (The specimen removed by Dr. Schwyzer is before you.)

He gave no history of ever having had pain in his back and the prostate, on rectal palpation, showed a soft adenoma, the lobes of which could be seen projecting into the bladder.

The point I wish to emphasize is that this shows the justification for cystoscopic examination in cases of enlarged prostate. I could detail several striking cases with unusual pathological findings which would have been overlooked, had we not made a cystoscopic examination.

DR. H. A. H. BOUMAN (Minneapolis) then read his inaugural Thesis, entitled "Fibroplastic Typhlitis and Appendicitis."

DISCUSSION

DR. A. SCHWYZER: The Academy is to be congratulated on hearing this interesting subject discussed so carefully by Dr. Bouman. It is of value to the surgeon especially. The fact that we have at times in inflammatory conditions, outside of acute perforation, an intense overgrowth of connective tissue, occurs in a great many places in the abdomen. The Doctor has mentioned hypertrophic ulcer of the stomach. Among a number of such cases one was a woman who, 20 years ago, was operated on and a very large ulcer was found at the pylorus. Nine months afterwards she was again operated on and a gastroenterostomy was done. She was quite well for years then. About 7 years afterwards I saw her. She was again vomiting practically everything, and an x-ray picture showed that this mass, which had apparently been as large as a man's fist, had dwindled away. A small streak of barium was indicating the pyloric antrum. The gastroenterostomy was almost closed. We could see now a new ulcer that was far up on the lesser curvature. We again operated and found the gastroenterostomy closed down to an opening in the mucosa of the size not more than a quill. We made a new gastroenterostomy in the same place as before and she

is living today—20 years after the first operation when the case had been declared to be carcinoma of the pylorus.

Within two weeks I saw three cases of diverticula of the colon. They presented the three main conditions that will occur in these cases. One was combined with carcinoma of the colon. Another was giving practically no symptoms and was a case where we operated for gallstones. The third was a fibroplastic condition. She had subacute appendicitis and when we operated on the appendix we made use of the opportunity of examining the sigmoid with the finger. There was an apparently inflammatory mass the size of a duck egg. The x-ray showed diverticula. Now after seven weeks I saw her again and gave her gas to examine how the condition was, and the mass is hardly to be felt; it is surely much smaller. All the treatment she had was regular doses of mineral oil.

In one of the cases of mine which the Doctor mentioned in his paper, the tumor was as large as an orange. On sectioning through the tumor, it was a very interesting picture. Hard fibrous concentric layers were seen, and in the center of this mass were the remnants of a gangrenous appendix and a little pus. The mass was nearly double the size of a man's fist.

The condition is a very important one to keep in mind.

DR. ZIMMERMAN: Fibroplastic exudates as described by Dr. Bouman are most likely to be found in the same locations where we are most likely to find carcinoma, viz., in the region of the cecum, the stomach, and the rectum and sigmoid. One point of differentiation that I think is important is that in the case of fibroplastic exudates, although the texture of the tumor is almost as hard and as firm as carcinoma, one is usually conscious of going through inflammatory tissue and muscles infiltrated with serous exudate before the tumor comes into view. This also applies to the differentiation between diverticulum of the sigmoid and a similarly situated carcinoma.

DR. G. SCHWYZER: In connection with Dr. Bouman's thesis, I wish to mention a case which I observed before x-rays were commonly used. An old lady of over 60 years came to us for stomach trouble. We made a diagnosis of possible carcinoma of the pylorus on account of a tumor which we felt in the region of the pylorus and on account of the very marked emaciation combined with a very low hemoglobin.

We operated and found, as we thought, a carcinoma of the pylorus. The tumor was about three inches long and of hard consistency. There was no doubt in my mind nor in the minds of the two physicians present at the time of the operation as to the nature of the growth. The run-down condition of the patient was such that a resection of the pylorus was not advisable. We, therefore, made a posterior gastroenterostomy from which the patient speedily recovered. We advised the patient to return to us in about two months, expecting a general improvement and intending to add a resection for the carcinoma of the pylorus at such later time.

Upon reopening the abdomen we found to our great surprise a normal pylorus. No tumor was there. We were unable to discover any pathology.

Inasmuch as we do not find very much written in the English literature on this subject, I think we ought to

report any such case which may fit into this subject so well and carefully analyzed by Dr. H. Bouman.

DR. BOUMAN (in closing): I wish to thank the gentlemen for their forbearance and particularly the Drs. Schwyzer and Hynes for the patients; without them I would not have been able to enlarge my surgical vision.

Regarding Dr. Zimmerman's remark, that we might suspect an inflammatory tumor from edema encountered in the skin: we did not see that, the general pathological procedure I have tried to describe. Bilharziasis, a disease occurring in Egypt and Arabia, should have been mentioned. The flukes remaining in the walls of the intestine are the reason for chronic inflammatory tumor formation.

As to Dr. Collins' question: The hyperplastic, allergic reaction may very well occur after appendectomy, but we hear of most of the cases before operation. As mentioned, the tumor may occur anywhere in the abdominal wall from any chronic irritation; the degree of allergy of a person is the important factor.

Thank you.

DR. H. L. ULRICH (Minneapolis) read a paper entitled "Subacute Bacterial Endocarditis." Numerous lantern slides were shown.

The meeting adjourned.

JOHN E. HYNES, M.D., Secretary.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

Minneapolis General Hospital

DIABETIC ACIDOSIS COMPLICATING PREGNANCY AND LABOR

Division B, Obstetrics and Gynecology

A. E. BENJAMIN, M.D., *Chief*

By JOHN URNER, M.D., *Resident*

Mrs. A. M., aged 29 years, para 7, gravida 8, came to the out-patient department about January 1, 1925, because the visiting nurses had found that she had glycosuria. She had had no symptoms of any kind pointing to this condition. The patient's last menstrual period was May 10, 1924, making the date of expectancy February 17, 1925.

Her past pregnancies were as follows: In 1911, 1912, 1917, 1919, and 1920 she delivered normal full-term babies, with normal pregnancies, labors, and puerperii. In 1922 she delivered a normal appearing full-term child, which was stillborn following instrumental delivery due to prolonged labor. In 1923 she delivered a normal, full-term infant, with normal pregnancy, labor, and puerperium.

The history of the present pregnancy was as follows: The patient had felt quite well throughout the early months during the first two trimesters. During the third trimester she developed slight edema of the extremities, occasional blurred vision, and rather persistent constipation. She had had urgency, frequency, and nocturia during this time,

but had not had the typical polyuria, polydipsia or polyphagia although polyphagia had been present to a slight extent.

At the time of her visit to the out-patient department, a large quantity of sugar was found in her urine. She was advised to enter the hospital, which she did, but remained only two days, leaving before her case could be studied thoroughly.

The patient was a well developed woman, 5 feet 6 inches in height, and weighing 185 pounds. Her skin was normal, except that it was rather pasty in appearance. Her teeth were carious. The thyroid was moderately enlarged. The heart and the chest were negative. The abdomen was enlarged to about the size of eight months pregnancy. The fetus was in O. D. A. position and in good condition. The patient's measurements were large in all diameters.

A blood sugar determination showed 0.21 with a Van Slyke of 64 per cent. Wassermann reaction was negative. The urine showed 15 gm. of sugar in a twenty-four hour specimen. The output was about 2,000 c.c. with a specific gravity of 0.1012. There was no acetone or diacetic acid present. Before her sugar tolerance could be determined the patient left the hospital, against advice, and went home on a diet low in carbohydrate and protein. She was instructed to return to the dispensary within a few days. She made two visits and each time the urine findings were about the same as those obtained in the hospital. She was repeatedly urged to come into the hospital again, as she was overdue. She made no other visits to the dispensary until March 1, when she complained of increasing weakness and dyspnea. Her breath smelled strongly of acetone. She was again admitted to the hospital March 1, 1925. The laboratory findings were as follows: Output of urine, 3,150 c.c., with 5 per cent sugar; acetone and diacetic present; hemoglobin, 70 per cent; erythrocytes, 3,900,000; leucocytes, 22,100; polymorphonuclears, 85 per cent. The patient felt well except for slight headaches and moderate dyspnea.

March 3 and 4 she was quite comfortable except for some slight cough and moderate dyspnea. On the morning of the fourth the blood chemistry report was as follows: Sugar 0.22 with a Van Slyke of 26 per cent. Castor oil and quinine were given in the hope of inducing labor, but without result.

March 5 at 9:00 a. m. the patient was very suddenly seized with extreme dyspnea of the Kussmaul type. She had many emeses of greenish material. Intraocular tension was diminished on palpation. Respirations were 32. Medical consultation was obtained and a diagnosis of extreme acidosis was made, with recommendation for alkaline treatment combined with insulin. Her condition became progressively severe and alarming, so 45 gm. of glucose in 10 per cent solution were injected slowly intravenously, and with this 30 units of insulin were given. In an hour she showed great improvement. Although still very dyspneic, she breathed with much less difficulty. During the rest of the day she was given 40 units of insulin subcutaneously with apparently still more relief. Lavage was used to control the vomiting, and proctoclysis of glucose and sodium bicarbonate given for fluid intake. During the night she was given 2,000 c.c. hypodermoclysis,

followed by 10 units of insulin and 200 c.c. of orange juice by mouth.

The following morning she was considerably improved, although moderately dyspneic. The blood showed a Van Slyke of 24 per cent, and blood sugar 0.16. The urine showed a slight reduction, with no acetone or diacetic. At this time she no longer felt fetal movements, the fetal heart could not be heard, and a diagnosis of antepartum death of the fetus was made.

The patient's condition now seemed to permit interference with safety and an attempt was made to insert a bag, but without success because the vaginal walls were so redundant and no anesthesia was used. Ten units of insulin were given. The morning of March 7, 20 units of insulin were given and at noon a bag was inserted. This was expelled at 4 p. m., and was followed by normal delivery of a stillborn, over-developed male child. Twenty units of insulin were again given and the patient showed much improvement in that the dyspnea was markedly reduced. She began to take more nourishment and felt generally better. March 8 she was given 10 units of insulin, and on the ninth 15 units, with the result that her condition was almost normal. March 12 the blood sugar was 0.20, with a Van Slyke of 52 per cent.

March 13 she was transferred to the medical service and very promptly signed out of the hospital before her tolerance could be determined and a systematic diet regime carried out.

Asbury Hospital

MELENA (POSSIBLY DUODENAL ULCER) IN NEWBORN

FRED L. ADAIR, M.D.
Minneapolis

B4041.—April 19, 1924. Age 28 years. Married sixteen months. Gravida I. The patient's last menstruation period was January 9 to 13, 1924. There had been slight nausea, but she was feeling well at the time of examination, and had always been in good health. Menses began when thirteen years of age, regular twenty-eight days, of four days' duration.

Past history—Mumps, varicella, pertussis, measles, and in 1918, influenza.

Physical examination—The uterus was enlarged to about the size of three and one-half months pregnancy. A soft, blowing systolic murmur was noted at the right base of the heart. Height, 5 feet, 1.5 inches. Weight, 104.5 pounds. Abdomen, F. 12, N. 14.5, X. 32, Cir. 73. Pelvic measurements, Insp. 23, Incr. 26, Intr. 28.5, E. C., 19.5, D. C. and Trans. ample. Temperature, 98.4; pulse, 98; blood pressure, 112/70. Urine, specific gravity, 1020, acid reaction, albumin and sugar, negative, microscopic examination, negative. Blood, hemoglobin 82 per cent, erythrocytes, 4,320,000; leucocytes, 14,600.

After this examination the patient left town and was not seen again until she entered the New Asbury Hospital (Minneapolis) October 19, 1924. At that time she stated that she had had labor pains irregularly for fifty-four hours, but not very severe or constant.

8:00 a. m. Position O. D. P.; head —3; cervix effaced; os dilated 3 cm.

12:30 p. m. Os dilated 5 cm.; head +2.

7:00 p. m. Dilatation complete; head +2, transverse arrest.

1:00 a. m. (October 20) position O. D. A.

3:25 a. m. Membranes ruptured.

4:30 a. m. Head on perineum; caput visible.

4:55 a. m. Low forceps applied.

5:05 a. m. Delivered.

The hemorrhage was about 300 c.c. The placenta and cord were normal. There was a first degree laceration, which was repaired.

The baby was a female, mature, not apneic, and had no external injury to the head. The weight at birth was 6 pounds 6½ ounces. Temperature: 98.4 to 97.8 on the first day; 99.8 to 97.8 on the second day; 97 to 96.2 on the third day; 99.6 on the fourth day, axilla. The loss of weight was about 8 ounces.

On the third day the baby had a bloody stool about 5:00 p. m. Fifty cubic centimeters of whole blood from the father were given subcutaneously at 7:30 p. m. At 10:00 p. m. 40 c.c. were given. During the night the baby had six bloody stools. On the fourth day 60 c.c. of blood were given intramuscularly and 30 c.c. by mouth. The bleeding continued and it was decided to give a transfusion. A fontanelle transfusion was attempted, but with beginning edema it was considered inadvisable to continue, and 130 c.c. were given intraperitoneally. That afternoon (October 23) the patient left the hospital against the advice of the physicians to take Christian Science treatment.

On October 22 the baby's bleeding time was one and one-half minutes and the coagulation time six minutes.

HERPES GESTATIONIS (DUHRING'S DISEASE IN PREGNANCY) WITH AN EFFECTIVE TREATMENT FOR IT

ROSS M. GAMBLE, M.D.
Ellendale, Minn.

The patient, a woman aged 23, had been under my care since she became pregnant in May, 1924. She previously had had four miscarriages, so was particularly careful of herself all through pregnancy. On December 16th, when 7 months pregnant, she abruptly developed a papular eruption on both legs which within a short time changed to papulo-vesicular in type. Many of these vesicles then coalesced to form blebs, some of which were as large as 1.5 cm. in diameter. With the eruption was an intense itching. A diagnosis of *herpes gestationis* was made, which was corroborated by two other physicians.

From other cases reported in the literature, it was found that no treatment save the premature induction of labor had ever been found very effective. This patient was particularly desirous of children, however, so everything which had been described as palliative of this condition was tried. Arsenic was given in the form of Fowler's solution and KI was also tried. Locally, various alkaline washes, calamin lotion, phenol-boric solution and other anti-pruritics were tried but none of them had much effect on the eruption or on the itching. The patient did not sleep for three nights, and on the fourth one-half grain of morphine sulphate only gave her a little over one hour of

sleep. There was also some systemic disturbance as noted in repeated emesis and a trace of albumin in the urine.

Ordinarily of late, organotherapy has been much overrated, but some of these obscure skin conditions do seem to have as a basis an adrenal dysfunction. Accordingly this patient was given 2 grains of desiccated suprarenal substance together with two grains of calcium lactate, five times a day, and twice daily she received a hypodermic of 7 minims of 1 to 1000 adrenalin. Thirty-six hours after this treatment was instituted, the itching was much relieved and after 4 days the eruption had faded, leaving crusts where the blebs had been which finally fell off and left erythematous spots with a slight pigmentation. After four or five days this treatment was discontinued and the patient was about normal for ten or twelve days. At the end of this time there was a return of the eruption and itching not only on the legs but also on the arms and to a lesser degree on the trunk. The same treatment was instituted with the same relief, except that this time the treatment was continued for two weeks (until Jan. 22, 1925). The patient was delivered Feb. 19th of a full term, living child. The delivery was normal in every way and the placenta was also normal.

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PREGNANCY WITH COMPLICATIONS: FACE PRESENTATION, CHIN ANTERIOR; ROTATION WITH FORCEPS; LATERAL CUTANEOUS FEMORAL NEURITIS. CASE REPORT

DANIEL H. BESSESEN, M.D.
Minneapolis, Minn.

This patient was followed until delivery by Dr. E. W. Alger, when, in his absence, she was referred to my care. The history showed nothing abnormal in a woman 28 years old with two previous full term deliveries of well developed boy and girl. Marked pain was complained of in the lower front of the pelvis in labor. Physical examination was entirely negative with the exception of a slight mitral regurgitation so often present in pregnant women. Rectal examination gave the impression of a face presentation, occiput posterior with complete dilatation. When more severe pain was complained of with little progress, the vaginal examination made after carefully preparing the patient proved the correctness of this impression. Dewees' forceps without the traction apparatus were applied in the usual manner, adjusting them to the child's head, and making sure of the locking, the fetal head was thrust well up into the mother's abdomen, rotated and brought down into the pelvis again. Due to the extreme curve of the forceps, it was necessary to remove them at this point and replace them in the usual curve to correspond to the axis of the mother's pelvis, after which the delivery of a 12-pound boy was without event. No tear was apparent in the perineum and mother and child made splendid recoveries. Three

weeks after delivery, the mother complained of pain over the outer side of the left thigh. This proved to be a left lateral femoral neuritis which cleared up very quickly with telatherm.

Pain in the lower front of the pelvis indicates pressure on the urethra and is usually brought about by the bony obstruction to the passage of the head. This may be present in a large head, transverse position or tumor masses, but most commonly it means a face presentation, occiput posterior.

The rotation of the head in occiput posterior positions may be made with the hand or with the forceps, depending upon the station of the child and upon the roominess of the pelvis. This delivery was made in the home, and less danger was believed to be incurred from infection by performing rotation with forceps than by doing a version. The Kielland forceps are especially designed for this type of delivery, because the shanks of the blades are only very slightly curved and it is not necessary after rotation to remove and replace the forceps as was required in this delivery. To use forceps, the patient should be under deep anesthesia, the uterus dilated, and the membranes ruptured. The forceps rotation is potentially dangerous because the pelvis of the mother may be injured by the turning blades.

The neuritis which occurred in this woman probably resulted from the mechanical injury done to the nerves on the left side of the pelvis in thrusting the head up into the abdomen and rotating. The awkward curve of the blades must be considered as partly liable to produce this injury. This possibility is diminished by the use of the Kielland blades.

Minneapolis General Hospital
 POSTDIPHTHERETIC NEURITIS
 J. C. MICHAEL, M.D.
Chief of Service

Mrs. M. M., aged 25 years, housewife. The patient was admitted to the neurological ward March 20, 1925, with paresis of legs and arms, generalized hyperesthesia, numbness of finger and toe tips, dysphasia, dysphagia, tinnitus, and blurred vision.

The previous history was negative until February 6, when the patient developed a sore throat. She was treated for quinsy until February 10, when diphtheria was diagnosed. Antitoxin was administered immediately, and three times thereafter at daily intervals. Thickness of speech and difficulty in swallowing appeared on February 11. Not long after, the finger tips began to feel numb. February 26 vision became blurred, and February 27 the patient was so weak that she was unable to walk. Her ears began to ring and since that time she had frequently had sharp pains through her ears.

Objective examination of the patient at the time of admission to the neurological ward revealed impairment of the muscles of the eyes, absence of triceps, biceps, knee and ankle jerks, and paralysis of the soft palate. March 29 the pulse rate increased to 130, temperature to 100, and respiration to 40.

The patient was seen April 7, at which time there was

evidence of much improvement. Temperature, pulse, and respiration had returned to normal.

This case is of interest particularly because of the early treatment and because of the widespread nerve involvement. Although palsy of the soft palate and pharyngeal muscles not infrequently follows diphtheritic infection, widespread nerve involvement is but rarely seen when antitoxin is administered promptly.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH

THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

THE INHERITANCE FACTOR IN TUBERCULOSIS—PREDISPOSITION OR IMMUNITY: Godias J. Drolet (The American Review of Tuberculosis, 1924, x, 280). Drolet finds a slightly larger percentage (66) of positive tuberculin reactions (Von Pirquet test) in 461 children of non-tuberculous parents than in 1,234 children of tuberculous parents (64 per cent) at the Bellevue Tuberculosis Dispensary (New York City). Of 2,605 adults having tuberculosis, 12 per cent gave a history of tuberculosis in the preceding generation as compared to 13 per cent for 1,638 non-tuberculous adults. When the children and adults were considered together, 30 per cent of all the non-tuberculous cases reported tuberculosis in the preceding generation as against 14 per cent of the tuberculous patients.

Studying the frequency of tuberculosis in the children of tuberculous parents Drolet found that among 1,577 such cases 34 per cent were tuberculous. Among 5,852 cases with negative parental history 59 per cent were tuberculous.

As to the results of treatment it was found that of 159 patients with a parental history of tuberculosis, 16 per cent became apparently cured or arrested while of 1,059 cases with a negative family history only 7 per cent reached a similar condition.

Drolet concludes that the children of tuberculous parents do not inherit even a predisposition to the disease but an increasing degree of immunity instead.

A. T. LAIRD, M.D.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

ANEURYSM OF THE RENAL ARTERY: Hilaire Schramm, Levou, Poland (Annals of Surgery, 1925, lxxxi, 105-107). In a recent review (Annals of Surgery, Nov., 1923) Conroy assembled thirty-two cases of aneurysm of the renal artery. The author of this article adds two cases to this number.

One, a male, thirty-two years of age, was stabbed in the left loin. The hemorrhage was checked with a tampon. Hematuria followed for sixteen days and a month after the wound there was severe hemorrhage from the bladder, which could be controlled for a short while by pressure on the left loin and by compressing the penis. About one and one-half years after he had been wounded he was admitted to the hospital suffering from marked anemia. Upon examination there was a large tumor in the left kidney region reaching to the linea alba, stretching under the left costal border below to the anterior superior iliac spine. At operation this tumor was found to be intimately adherent to the left kidney and to the aorta. This with the kidney was removed. The tumor proved to be an aneurysmal sac of the renal artery, the size of an orange.

The second case reported was one of Doctor Sakolowski's. In a woman of fifty, who died of symptoms of internal hemorrhage, a postmortem examination revealed an extensive hematoma in the left loin, the source of which was a ruptured aneurysm of the renal artery, the size of a walnut.

Of the thirty-four cases in literature, sixteen were true spontaneous aneurysms. The average age of these patients was 56. Many were found only at postmortem examination. In eighteen cases there were traumatic aneurysms. In fifteen of these the injury was subcutaneous; only three times was there an open wound of the kidney.

The prognosis is very grave in these cases. All cases treated conservatively died; of those operated two died and seven were healed. Operation is almost always serious and difficult, especially on account of the danger of rupturing the sac, or because of the proximity of the aneurysm to the aortic wall. In most cases the kidney must be removed.

J. K. HOLLOWAY, M.D.

LYMPHATICOSTOMY: Edwin P. Lehman and Clover H. Copher (Archives of Surgery, Volume 10, No. 2, March, 1925, pp. 742-751). The authors report their experience in work done upon animals with peritonitis and one case of general peritonitis in a human being in which lymphaticostomy was performed. This work was done to check up the work reported previously by Costain.

Fourteen dogs had their appendices ligated in the same way in which Costain produced peritonitis. Four of these

survived. The average length of life of those which died after the procedure was 4.2 days. Fourteen other dogs prepared as above had a drainage of the thoracic duct twenty-four hours later. All of these died and the average length of life was 2.7 days.

Further experimental work was done to investigate the effect of lymphaticostomy in high intestinal obstruction. Fourteen dogs with a fifteen centimeter isolated high jejunal loop lived an average of 2.3 days. Fourteen other dogs underwent drainage of the thoracic duct twenty-four hours after construction of the high jejunal loops as before. The average length of life in this group was 3.8 days.

The case report concerned a male twenty-seven years of age with general purulent peritonitis caused by a ruptured appendix. Lymphaticostomy was done in this case and was followed by improvement in the patient's general condition even though he died some days later.

The authors summarize their results as follows:

"Drainage of the thoracic duct in the dog does not exert a favorable influence on general peritonitis. It may exert a slightly favorable influence in the course of toxemia from intestinal obstruction. Clinical observation of a single case of general peritonitis suggests a slightly favorable effect from drainage of the thoracic duct."

WILLIAM P. HERBST, M.D.

RADIUM IN THE TREATMENT OF PROSTATIC CARCINOMA: B. S. Barringer, M.D. (Annals Surgery, 1924, LXXX, 881-884). The technique of radium application described in this article differs somewhat from the methods of Bumpus and Young. Screened radium needles are introduced through the perineum, one to two centimeters apart, throughout the carcinomatous prostate. Other needles are passed into the seminal vesicles, at times through the rectum. The dosage varies with the size of the tumor, but rarely exceeds 800 mc. hours. The treatment is completed within two to three months. In cases which react well the radium treatments are repeated every two to three months until the prostate is a sclerosed mass. If urethral invasion occurs treatment is directed there.

In advanced cases with urinary obstruction the author uses a modified Young punch instrument, and removes several large pieces of tissue from the bladder neck. In thirteen cases thus operated, twelve showed some reduction in the amount of residual urine, though the operation was considered successful in only 8 (61.8%).

Of forty-six cases, where malignancy was limited to the gland in but one, five lived more than five years without sign of recurrence. Of forty-four cases reviewed showing bony metastasis, thirty-nine had involvement of the lumbar spine, pelvis, and upper end of the femur. Most of the metastases were the sclerosing hyperplastic type.

The author believes five to ten per cent of cases of carcinoma should be controlled by radium. He recommends that in all cases where diagnosis is in question a "diagnostic needle," which he describes, should be used to secure specimens of prostatic tissue for biopsy. It is considered of especial value in early and questionable cases.

JACKSON K. HOLLOWAY, M.D.

MELANOMA OF THE NAIL BED: T. Banford Jones, M.D. (Annals of Surgery, vol. lxxx, 1924, pp. 839-847). Dr. A. E. Hertzler, in a recent review of the literature, was able to find seventeen cases of melanoma of the nail bed. The author reviews three cases seen at the Massachusetts General Hospital. The onset of this condition is frequently attributed to injury and closely resembles whitlow. However, at the edge of the inflamed nail a little border of coal black color may be seen. Trauma antedated the subsequent development of lesions in most of the cases reported, including all of the author's. The condition is one of slow development, the period of quiescence averaging from four to five years. However, once the initial lesion progresses noticeably, a rapid fatal course is inevitable. The lesion appears as a paronychia but is chronic. It gradually increases in size, eventually ulcerating and destroying the nail. Presence of pigment is pathognomonic. Following this stage progress is very rapid and metastatic growth is soon evidenced. Pain and local tenderness may characterize the later stages of development.

In suspicious cases biopsy should be made. Minimum treatment means amputation of the digit and complete resection of the regional glands.

In the three cases reported, diagnosis was made too late to prevent death from general metastasis.

J. K. HOLLOWAY, M.D.

PYLORIC SPASM AND ITS SURGICAL TREATMENT: Raffaele Bastianelli, Rome, Italy (Annals of Surgery, 1925, vol. lxxxi, pp. 45-51). The author reports the results of four cases operated upon in which the findings were those of thickened pylorus, but without demonstrable lesion. The clinical symptoms were those of pyloric spasm. Sphincterotomy, according to Rammstedt, produced beneficial results. The cases have been done recently so no final conclusions may be drawn, although the primary results are very encouraging. The author discusses theories of pyloric spasm.

J. K. HOLLOWAY, M.D.

IMPROVED TECHNIC FOR INTESTINAL ANASTOMOSIS: Clyde A. Roeder, M.D. (Annals of Surgery, lxxx, 1924, pp. 939-943). Intestinal anastomosis is confronted with the highest mortality rate of any elective operation within the abdominal cavity, owing to (1) lack of aseptic technic enhanced by preoperative morbidity, (2) leakage, (3) secondary obstruction, (4) hemorrhage.

The author offers a modification in the form of an aseptic anastomosis. His technic is as follows: Crushed edges of intestines are approximated by a mattress suture drawn tightly. The contaminated end of suture is swabbed with phenol. A continuous Lambert silk seromuscular suture then inverts the cut and crushed edges. One end of the mattress is then cut short and the remainder is withdrawn from the gut.

The author claims very good results from this improved technic. He states that intestinal mucosa will not bleed when not sutured if it is previously crushed and cut with a cautery, and it will also unite in due time with no secondary ulcer formation.

J. K. HOLLOWAY, M.D.

ROENTGENOLOGY

SUPERVISORS:

LEO G. RIGLER,

MPLS. GEN'L HOSPITAL, MINNEAPOLIS

A. U. DESJARDINS,

MAYO CLINIC, ROCHESTER

THE CLINICAL IMPORTANCE OF CHRONIC CHANGES IN THE APPENDIX: Franklin W. White (*Am. Jour. Roent.*, Vol. 13, p. 12, Jan., 1925). Chronic changes in the appendix are due to previous or recurrent attacks of acute inflammation.

The direct roentgen signs are as follows:

1. Tenderness over a filled appendix is the most significant. It is not a valuable sign, however, in ptosis cases.
2. Failure to fill cannot be interpreted so no diagnosis can be made.
3. Failure to empty for several days after the cecum has emptied is important.
4. Fixation, especially of the tip or the middle portion, is of considerable significance.
5. Changes in shape, if very constant, aid in the diagnosis. Kinking is often only apparent.
6. Position is variable normally but a very high or very low appendix or one behind the cecum merits consideration.

The indirect signs are:

1. Ileal stasis is of importance except where other causes can be made out, such as general atony, old age, etc.
2. Pyloric and duodenal spasm are uncommon, occurring in only 7 per cent of the author's positive cases. There are so many other causes for this condition that it has little significance.

The signs given are of value, if several are present in the same case, as corroborative evidence when a fairly good history of this condition is present. The roentgen evidence is so striking that great care must be exercised not to over-emphasize it. The most important signs found in the author's positive cases were tenderness, constant changes in shape, fixation, and abnormal position.

LEO G. RIGLER, M.D.

THE ROENTGEN DIAGNOSIS OF ESOPHAGEAL DIVERTICULA: M. Haudek (*Fort. a. d. Geb. D. Roentgenstrahlen*, Vol. 32, p. 556, Dec., 1924). Eleven cases of small diverticula of the esophagus are described. The small traction diverticula are found secondarily during the roentgen examination, if systematic thorough investigation is made. The use of a thick barium paste, the patient being in the recumbent position with the hips elevated, is most successful. The examination must be made at all angles and great care must be exercised as the diverticula empty very rapidly.

These peckets are frequently overlooked because they are often symptomless and roentgen examination is done

only when complications such as spasm occur. Nevertheless they may be the cause of severe ulcerations. They are most often secondary to mediastinal lesions, and are commonly found in the anterior wall of the proximal third of the esophagus.

Pulsion diverticula are much less common and cause acute symptoms usually as a result of the retention of foreign bodies such as food particles.

The importance of the demonstration of small diverticula is prognostic in that they may later produce severe results such as ulceration, retention of food, or perforation into the esophagus by the caseous mediastinal glands to which they are adherent.

LEO G. RIGLER, M.D.

ATELECTASIS AS A ROENTGEN-RAY SIGN OF FOREIGN BODY IN THE AIR PASSAGES: Manges (*Am. Jour. Roent.*, June, 1924). The roentgenographic appearance of atelectasis is as follows: Extreme density of the portion of lung affected is present; the density is usually confined to one lobe and follows the interlobar fissure; heart and mediastinum are displaced toward the affected side; there is elevation of the diaphragm on the affected side.

This condition is differentiated from massive pulmonary consolidations, massive tumors, pleural thickening and pleural exudate chiefly by the displacement of the heart and mediastinum toward the atelectatic lung. It cannot be distinguished from extensive lung fibrosis by the roentgenogram alone.

Where the mass obstructing the bronchus completely closes it off to inspiration, atelectasis occurs due to absorption of the air in the affected portion of the lung. If the obstruction is incomplete, emphysema will result, giving roentgen signs which are the reverse of those described for atelectasis, namely, increased radiability of the affected lung, depression of the diaphragm on the affected side, displacement of the heart and mediastinum away from the affected side.

LEO G. RIGLER.

MUST CHOOSE DOCTORS FOR FITNESS

Medical schools do not urge a general influx of students and have standards which make it likely that most of those who gain admission will have the ability to succeed, according to Dean E. P. Lyon, of the Medical School.

"Some physicians make a good deal of money," he says, "but men should go into medicine because they are drawn to it, because they are assured of a useful life and a reasonably good living, not for other reasons. The problem of selecting men who shall study medicine is not one of deciding whether there are too few or too many doctors, nor one of financial prospects. It is a question of fitness."

The three main characteristics of the medical student should be, Dean Lyon thinks, that he should seek to render service rather than gain wealth, that he should be of high integrity, and that he should be a person of high intelligence. Medicine, he explains, rests on complex sciences. It involves a very large body of certain knowledge that must be mastered and retained, and requires use of judgment in

the highest degree, because the knowledge must be applied to living persons. Error must be held to an irreducible minimum when it comes to applying facts in a particular case.

"Men of the right sort need not hesitate to enter medicine," Dean Lyon says. "Physicians are somewhat better paid than men in some other professions, but they put in a long and costly period of training and carry grave responsibilities."

For dentistry one may turn to a vocational bulletin recently issued by Dean Alfred Owre, a recognized leader in his profession.

"A well qualified dentist can always make an adequate living immediately after graduation," he writes. "This is especially so if he is willing to leave the cities and practice in less thickly settled communities. In the large cities, except in outlying districts, competition is keener. In dentistry, as in every other profession, there is always room at the top. It is at the top that there are opportunities for specialization, which are both financially rewarding and professionally satisfying.

"The most important question every young man considering his life work should ask is, 'Can I find in this profession full expression for my faculties? Can I look forward to continued cultural as well as professional development?' This can be answered in the affirmative. Modern dentistry, as it is and as it promises to be, offers to the properly qualified and trained graduate every opportunity for professional growth. It also offers, as few professions can, satisfaction of the creative instinct."—*Minnesota Chats*, Vol. 4, No. 75.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

INTERNATIONAL CLINICS. Edited by Henry W. Cattell, A.M., M.D., Philadelphia, in collaboration with others. Volume I. Thirty-fifth series, 1925. 301 pages. Illus. Philadelphia & London: J. B. Lippincott Co., 1925.

FROM INFANCY TO CHILDHOOD. Richard M. Smith, M.D., Assistant Professor of Child Hygiene, Harvard University; Associate Physician, Children's Hospital; Visiting Physician, Infants Hospital, Boston. 105 pages. Cloth, \$1.25. Boston: Atlantic Monthly Press, 1925.

THE PRACTICAL MEDICINE SERIES. Gynecology and Obstetrics. Vol. V. Edited by Thomas G. Watkins, M.D., F.A.C.S., and Joseph B. De Lee, A.M., M.D., in collaboration with J. P. Greenhill, B.S., M.D. 534 pages. Illus. Cloth, \$2.00. Chicago: The Year Book Publishers, 1925.

DISEASES AND DEFORMITIES OF THE FOOT. John Joseph Nutt, B.L., M.D., F.A.C.S., Professor of Orthopedic Surgery, Polyclinic Medical School and Hospital, etc. 2nd edition, revised and enlarged. 309 pages. Illus. Cloth, \$4.00. New York: E. B. Treat and Company, 1925.

ANATOMY OF THE HUMAN BODY. Henry Gray, F.R.S. Twenty-first edition. By Warren H. Lewis. 1417 pages. Illustrated. Lea & Febiger, Phil. & N. Y., 1924. \$10.00.

When a new edition of Gray's Anatomy appears it is needless for the reviewer to write many words in praise of the work, for it has been for so long a time, since 1858 in

fact, the standard text book of descriptive anatomy, that it is only the new editions that need mention. The latest edition, the twenty-first, will seem very familiar to users of the older editions, but new sections on the heart and ductless glands will be found and some of the old plates have apparently been replaced by newer and better ones. The embryological sections are enlarged and very clearly written. The English B. N. A. nomenclature is again used and older practitioners will not be confused by finding an unfamiliar terminology.

WALLACE H. COLE, M.D.

FUNDAMENTALS OF HUMAN PHYSIOLOGY. R. G. Pearce and J. J. R. Macleod. St. Louis: C. V. Mosby Co., 1924.

As the name implies, this book gives the fundamentals of human physiology. As it is written for people without much preliminary detailed knowledge of anatomy, chemistry or physics, it is suitable for nurses, home economic students, etc.

The subject matter is well arranged and it is illustrated sufficiently. The book is used in certain elementary classes at the University of Minnesota.

F. H. SCOTT, M.D.

MANAGEMENT OF DIABETES. George A. Harrop, Jr., M.D. 190 pages. Cloth, \$2.00. New York: Paul B. Hoeber, 1924.

From June to September, 1923, a postgraduate course of lectures was given at the Presbyterian Hospital, New York, by various members of the staff of the hospital to some six hundred practicing physicians on the subject of the present day treatment of diabetes. This small volume is based on those lectures and for conciseness and practical assistance to the general practitioner is the very best work encountered by the reviewer.

Enough time has now elapsed since the advent of insulin so that the method of its use in the treatment of diabetes has been established.

The present conception of metabolism, the ketogenic anti-ketogenic ratio, ketosis and acidosis is briefly described and laboratory methods for determining abnormalities of metabolism in diabetes are clearly presented. Practical methods for determining proper diets are well described and food tables with valuable suggestions for preparing diets are given. The practitioner who is called upon to treat diabetes and who has been perhaps confused by the variety of views appearing in the literature will find in this small volume a most complete but at the same time well boiled down summary of the treatment of diabetes.

C. B. DRAKE, M. D.

A PRACTICAL COURSE IN STANDARDIZED PHYSIOTHERAPY, under auspices of Biophysical Research Department of Victor X-Ray Corporation, is now available to physicians. Offers a highly practical knowledge of all the fundamental principles that go to make up the standards of modern scientific physiotherapeutic work. Course requires one week's time. For further information apply to J. F. Wainwright, Registrar, 236 South Robey Street, Chicago, Ill.

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Blue Earth County	T. C. KELLY, M.D., Mankato	W. C. STILLWELL, M.D., Mankato
Blue Earth Valley	W. H. GOUGH, M.D., Granada	R. C. HUNT, M.D., Fairmont
Camp Release District	L. G. SMITH, M.D., Montevideo	L. J. HOLMBERG, M.D., Canby
Central Minnesota District	CHARLES SWENSON, M.D., Braham	H. C. COONEY, M.D., Princeton
Chisago-Pine County	H. P. DREDGE, M.D., Sandstone	C. G. KELSEY, M.D., Hinckley
Clay-Becker County	E. W. HUMPHREY, M.D., Moorhead	J. H. HEIMARK, M.D., Moorhead
Dodge County	F. D. SMITH, M.D., Kasson	C. E. BIGELOW, M.D., Dodge Center
Freeborn County	J. P. VON BERG, M.D., Albert Lea	J. W. GAMBLE, M.D., Albert Lea
Goodhue County	N. L. WERNER, M.D., Red Wing	M. W. SMITH, M.D., Red Wing
Hennepin County	EMIL GEIST, M.D., Minneapolis	R. T. LAVAKE, M.D., Minneapolis
Houston-Fillmore County	CYRUS B. EBY, M.D., Spring Valley	O. F. FISCHER, M.D., Houston
Kandiyohi-Swift County	R. J. HODAPP, M.D., Willmar	C. L. SCOFIELD, M.D., Benson
Lyon-Lincoln County	G. L. JACQUOT, M.D., Tyler	H. M. WORKMAN, M.D., Tracy
McLeod County	W. R. SCHMIDT, M.D., Glencoe	D. L. AXILROD, M.D., Hutchinson
Meeker County	FRANK BRIGHAM, M.D., Watkins	K. A. DANIELSON, M.D., Litchfield
Mower County	G. E. HERTEL, M.D., Austin	P. A. LOMMEN, M.D., Austin
Nicollet-LeSueur County	SWAN ERICSON, M.D., LeSueur	GEO. T. BASKETT, M.D., St. Peter
Olmsted County	GEORGE STEVENS, M.D., Byron	M. C. PIPER, M.D., Rochester
Park Region	W. S. BROKER, M.D., Battle Lake	T. S. PAULSON, M.D., Fergus Falls
Ramsey County	E. M. HAMMES, M.D., St. Paul	A. G. SCHULZE, M.D., St. Paul
Red River Valley	A. A. KAHALA, M.D., Crookston	M. O. OPPEGAARD, M.D., Crookston
Redwood-Brown County	JOHN ADAMS, M.D., Morgan	WM. A. MEIERDING, M.D., Springfield
Rice County	C. M. ROBILIARD, M.D., Faribault	C. A. TRAEGER, M.D., Faribault
St. Louis County	F. H. MAGNEY, M.D., Duluth	H. C. ANDERSON, M.D., Duluth
Scott-Carver County	F. J. VON BOHLAND, M.D., Belle Plaine	H. W. REITER, M.D., Shakopee
Southwestern Minnesota District	J. M. HILGER, M.D., Iona	E. G. McKEOWN, M.D., Pipestone
Stearns-Benton County	C. B. LEWIS, M.D., St. Cloud	J. N. LIBERT, M.D., St. Cloud
Steele County	A. B. STEWART, M.D., Owatonna	E. W. SENN, M.D., Owatonna
Upper Mississippi	L. T. DAVIS, M.D., Wadena	G. I. BADEAUX, M.D., Brainerd
Wabasha County	H. E. BOWERS, M.D., Lake City	W. F. WILSON, M.D., Lake City
Waseca County	H. A. MILLER, M.D., Waseca	B. J. GALLAGHER, M.D., Waseca
Washington County	E. O'B. FRELICH, M.D., Stillwater	R. J. JOSEWSKI, M.D., Stillwater
Watonwan County	ALBERT THOMPSON, M.D., St. James	H. B. GRIMES, M.D., Madelia
West Central	E. T. FITZGERALD, M.D., Morris	AMOS LEUTY, M.D., Morris
Winona County	E. D. RISSER, M.D., Winona	I. W. STEINER, M.D., Winona
Wright County	O. J. FREED, M.D., Cokato	JOHN J. CATLIN, M.D., Buffalo

Minnesota State Medical Association

DISTRICT AND COUNTY ROSTER

FIRST DISTRICT

COUNCILOR, G. S. WATTAM, M.D. (3 years) Warren

Clay-Becker County Medical Society

Regular meetings, second Thursday, January, April, July and October

Annual meeting, October

President
Humphrey, E. W. Moorhead
Secretary
Heimark, J. H. Moorhead
Aborn, W. H. Hawley
Archibald, F. M. Mahanomen
Berghelm, M. C. Hawley
Bottolfson, B. T. Moorhead

Cyr, A. Barnesville
Darrow, D. C. Moorhead
Gosslee, G. L. Moorhead
Griffin, P. J. Gary
Gunderson, R. M. Lake Park
Hagen, O. J. Moorhead
Haight, G. G. Audubon
Heimark, Jacob H. Moorhead
Hoit, E. E. Detroit

Humphrey, E. W. Moorhead
Larson, O. O. Detroit
Lowe, L. M. Glyndon
Rutledge, L. H. Detroit
Simison, C. W. Hawley
Thornby, H. J. Moorhead
Thysell, F. A. Moorhead
Weeks, L. C. Detroit
Winberg, O. K. Lake Park

Red River Valley Medical Society

Kittson, Marshall, Polk, Roseau, Pennington, Red Lake, Norman and Mahanomen Counties

Regular meetings, second Tuesday in April, September and December

Annual meeting, December

President
Kahala, A. A. Crookston
Secretary
Oppegaard, M. O. Crookston

Adkins, C. M. Grygla
Ahlfs, J. J. Erskine
Anderson, W. S. Minneapolis
Bernard, B. C. Thief River Falls
Bertelson, O. L. Crookston
Biedermann, Jacob Thief River Falls
Blegen, H. M. Warren
Borreson, B. Remer
Bowers, J. T. Thief River Falls
Bratrud, O. E. Warren
Bratrud, Theo. Warren
Brown, Lyle L. Crookston
Clark, Chester H. Gallup, N. M.

Clark, Lenna E. Gallup, N. M.
Daniels, W. H. Crookston
Delmore, J. L. Roseau
Dryden, F. M. Crookston
Dunlop, Alex. Crookston
Froelich, H. W. Thief River Falls
Henney, Wm. H. McIntosh
Hodgson, H. H. Crookston
Hollands, Wm. H. Fisher
Holmes, W. B. Ada
Holte, Halvor Crookston
Kahala, Arthur Crookston
Kirk, G. P. East Grand Forks
Kjelland, J. S. East Ellsworth, Wisc.
Larson, A. L. Fertile
Locken, O. E. Crookston
Mattson, R. H. New Rockford, N. D.
Meland, O. N. Warren
Mellby, O. F. Thief River Falls

Milan, M. Geo. Warren
Morley, G. A. Crookston
Nelson, H. E. Crookston
Nerad, A. H. Argyle
Norman, J. F. Crookston
Ohnstad, J. McIntosh
Oppegaard, C. L. Crookston
Oppegaard, M. O. Crookston
Overend, K. V. Hallock
Risjord, J. N. Fertile
Roy, J. A. Red Lake Falls
Sather, Allen Fosston
Shaleen, A. W. Hallock
Shedlov, A. Gully
Shelland, J. T. Ada
Swedenberg, A. W. Thief River Falls
Watson, N. M. Red Lake Falls
Wattam, G. S. Warren
Werner, O. S. St. Hilaire
Wilttrout, I. Geo. Oslo

West Central Minnesota Medical Society

Bigstone, Traverse, Stevens and Pope Counties

Regular meetings, June and December

Annual meeting, December

President
Fitzgerald, E. T. Morris
Secretary
Leuty, Amos Morris
Arnson, J. M. Graceville
Bates, B. V. Wheaton
Bergen, Otto Clinton
Bolsta, Chas. Ortonville
Caine, C. E. Morris

Christenson, C. R. Starbuck
Crandall, Wm. Graceville
Eberlin, E. A. Glenwood
Elsey, J. R. Glenwood
Ewing, C. F. Wheaton
Fitzgerald, E. T. Morris
Gibbon, L. L. Lowry
Karn, B. R. Ortonville
Leland, J. T. Herman
Leuty, Amos Morris

Lindberg, A. L. Wheaton
Linde, Herman Cyrus
Oliver, C. I. Graceville
O'Donnell, D. M. Ortonville
Opheim, O. V. Starbuck
Pierson, Claude M. Wheaton
Randall, E. M. Graceville
Ransom, L. M. Hancock
Shelver, H. J. Ortonville
Weir, J. D. Beardsley

Park Region District Medical Society

Ottertail, Douglas, Grant and Wilkin Counties

Regular meetings, second Wednesday in January, April, July and October

Annual meeting in October

President
Broker, W. S. Battle Lake
Secretary
Paulson, Theo. S. Fergus Falls

Baker, A. C. Fergus Falls
Boysen, P. Pelican Rapids
Brabec, F. J. Perham
Broker, W. S. Battle Lake
Burnap, W. L. Fergus Falls
Cowing, P. G. Evansville
Drought, W. W. Fergus Falls

Esser, John Perham
Estrem, C. O. Fergus Falls
Freeborn, J. A. Fergus Falls
Goodson, Catherine M. Retreat, Pa.
Hand, W. R. Elbow Lake
Haskell, A. D. Alexandria
Haugen, G. T. Fergus Falls
Kittelston, Theo. N. Fergus Falls
Lee, W. A. Fergus Falls
Lewis, A. J. Henning
Liebold, H. H. Parkers Prairie
Love, Fred A. Carlos
Meckstroth, C. N. Brandon
Naegeli, Frank. Fergus Falls

Nelson, O. N. Battle Lake
Otto, H. C. Frazee
Parson, L. R. Elbow Lake
Patterson, W. L. Fergus Falls
Paulson, Theo. S. Fergus Falls
Powers, F. W. Barrett
Reeve, E. T. Elbow Lake
Sargeant, H. L. Fergus Falls
Satersmoen, Theo. Pelican Rapids
Sherping, O. Th. Fergus Falls
Tanquist, E. Alexandria
Vail, J. B. Henning
Vigen, J. G. Fergus Falls
Wray, W. E. Campbell

SECOND DISTRICT

COUNCILOR, J. G. MILLSPAUGH, M.D. (1 year) Little Falls

Upper Mississippi Medical Society

Aitkin, Crow Wing, Morrison, Cass, Todd, Wadena, Clearwater, Koochiching, Hubbard,
Itasca and Beltrami Counties

Regular meetings in May and January

Annual meeting, January

President
Davis, L. T. Wadena
Secretary
Badeaux, G. I. Brainerd
Ahrens, E. G. Ah Gwah Ching
Allen, F. A. Crosby
Allen, F. H. Staples
Anderson, A. S. Ah Gwah Ching
Badeaux, G. I. Brainerd
Beise, R. A. Brainerd
Bone, Merle Kelliher
Button, A. J. Hackensack
Cantwell, W. F. Internat'l Falls
Christie, G. R. Long Prairie
Christie, R. L. Long Prairie
Corrigan, J. E. Spooner
Craig, C. C. International Falls
Crowl, Verne C. Bertha
Davis, L. T. Wadena

Davis, T. C. Wadena
Derauf, E. I. Brainerd
Douglass, J. E. State Sanatorium
Forrest, C. G. Clearbrook
Gerber, Milo P. Brainerd
Ghostley, Mary C. Internat'l Falls
Goodheart, C. J. Akeley
Halenbeck, P. L. Crosby
Holst, C. F. Little Falls
Holst, J. E. Little Falls
House, Z. E. Cass Lake
Houston, C. A. Park Rapids
Hoosier, J. International Falls
Johnson, E. W. Bemidji
Johnson, O. V. Sebeka
Kelly, B. W. Aitkin
Kenyon, Paul Wadena
Kerlan, S. Z. McGregor
Laney, R. L. Puposky
McHugh, R. F. Aitkin

McKennon, J. J. Wadena
Miller, W. A. New York Mills
Millsbaugh, J. G. Little Falls
Moyer, Ralph E. Bemidji
Nelson, Nesmuth Brainerd
Nicholson, Jos. Brainerd
Nordin, C. G. Brainerd
Parrott, B. W. Long Prairie
Pengelly, E. J. Ironton
Ratcliffe, J. J. Aitkin
Roberts, L. M. Little Falls
Shannon, S. S. Crosby
Smith, B. A. Crosby
Thabes, J. A. Brainerd
Waldie, Geo. McL. Wadena
Watson, A. M. Royalton
Watson, J. D. Holdingford
Wilcox, F. L. Walker
Will, W. W. Bertha
Williams, R. J. Pine River

THIRD DISTRICT

COUNCILOR, H. LONGSTREET TAYLOR, M.D. (1 year) St. Paul

Ramsey County Medical Society

Regular meetings, last Monday of each month except June, July and August

Annual meeting last Monday in January

President
Hammes, E. M. St. Paul
Secretary
Schulze, A. G. St. Paul
Abbott, J. S. St. Paul
Abramovich, J. H. St. Paul
Ahrens, A. E. St. Paul
Ahrens, A. H. St. Paul
Alberts, Max W. St. Paul
Alden, J. F. St. Paul
Aldes, Harry St. Paul
Alexander, F. H. St. Paul
Allen, Mason St. Paul
Anderson, W. T. St. Paul
Arends, A. T. St. Paul
Armstrong, J. M. St. Paul
Arnquist, A. S. St. Paul
Arouni, Khalil St. Paul
Arzt, C. P. St. Paul
Bacon, Donald K. St. Paul
Bacon, Knox St. Paul
Bacon, L. C. St. Paul
Balcome, F. E. St. Paul
Ball, C. R. St. Paul
Barry, L. W. St. Paul
Barsness, Nellie St. Paul
Beadie, W. D. Cannon Falls
Beals, Hugh St. Paul
Bell, C. C. St. Paul
Benep, L. M. St. Paul
Bennion, P. H. St. Paul
Bentley, Norman P. St. Paul
Berrisford, Paul D. St. Paul
Binger, H. E. St. Paul
Birnberg, T. L. St. Paul
Bock, R. A. St. Paul
Boeckmann, Eduard St. Paul
Boeckmann, Egil St. Paul
Bohland, E. H. St. Paul
Bole, R. S. St. Paul
Boleyn, E. S. Stillwater
Bolstad, H. C. St. Paul
Bosworth, Robinson St. Paul
Bouma, L. R. St. Paul
Brand, G. D. St. Paul
Bray, E. R. St. Paul
Brimhall, J. B. St. Paul
Brodie, Walter D. St. Paul
Brooks, D. F. St. Paul
Brooks, G. F. St. Paul
Brown, Edw. I. St. Paul
Brown, John C. St. Paul

Burch, F. E. St. Paul
Burfiend, G. H. St. Paul
Burns, F. W. St. Paul
Burns, R. M. St. Paul
Buscher, H. St. Paul
Caldwell, Kenneth S. St. Paul
Cameron, J. A. St. Paul
Campbell, J. E. South St. Paul
Cannon, Harry St. Paul
Carman, C. L. St. Paul
Carman, Paul I. St. Paul
Carroll, Wm. C. St. Paul
Carter, Fred C. St. Paul
Cavanaugh, J. O. St. Paul
Chandler, O. B. St. Paul
Chatterton, C. C. St. Paul
Christiansen, A. St. Paul
Christison, J. T. St. Paul
Clark, T. C. Soldiers Home, Mpls.
Cobb, S. G. St. Paul
Colby, Woodard St. Paul
Cole, Wallace St. Paul
Collie, H. G. St. Paul
Colvin, A. R. St. Paul
Comstock, A. E. St. Paul
Conner, Wm. H. St. Paul
Connor, C. E. St. Paul
Cook, Paul B. St. Paul
Countryman, Roger S. St. Paul
Cowern, E. W. North St. Paul
Critchfield, L. R. St. Paul
Dack, L. G. St. Paul
Darling, J. B. St. Paul
Daugherty, E. B. St. Paul
Daugherty, L. E. St. Paul
Davis, Herbert St. Paul
Davis, William St. Paul
Dedolph, K. St. Paul
Dickson, Thos. H., Jr. St. Paul
Dittman, Geo. C. St. Paul
Dohm, A. J. St. Paul
Donohue, P. F. St. Paul
Drake, Carl B. St. Paul
Dunn, J. N. St. Paul
Earl, Geo. A. St. Paul
Earl, Robert O. St. Paul
Edlund, G. St. Paul
Ely, O. S. South St. Paul
Engberg, E. J. St. Paul
Ernest, G. C. St. Paul
Eshelby, E. C. St. Paul
Evert, John A. St. Paul
Fahey, E. W. St. Paul
Ferguson, J. C. St. Paul

Fesler, Harold H. St. Paul
Flagstad, A. E. St. Paul
Fogarty, C. W. St. Paul
Foley, F. E. B. St. Paul
Freeman, C. D. St. Paul
Fulton, J. F. St. Paul
Furber, W. W. Cottage Grove
Gager, E. C. St. Paul
Gardiner, D. G. St. Paul
Geer, Everett K. St. Paul
Geissinger, John D. St. Paul
Geist, Geo. A. St. Paul
Ghent, Harry St. Paul
Ghent, M. M. St. Paul
Giere, E. O. St. Paul
Glifillan, J. S. St. Paul
Ginsberg, Wm. St. Paul
Goltz, E. V. St. Paul
Gotham, C. L. St. Paul
Grant, H. W. St. Paul
Gratzek, Thos. St. Paul
Greene, C. L. St. Paul
Gruenhagen, Arnold P. St. Paul
Hagaman, Geo. K. St. Paul
Hall, A. R. St. Paul
Halper, P. A. St. Paul
Hammes, E. M. St. Paul
Hammond, J. F. St. Paul
Harmon, G. E. St. Paul
Hauser, Victor St. Paul
Hawkins, V. J. St. Paul
Heath, A. C. St. Paul
Hengstler, W. H. St. Paul
Hensel, C. N. St. Paul
Herrmann, E. T. St. Paul
Hesselgrave, S. S. St. Paul
Hilger, A. W. St. Paul
Hilger, D. D. St. Paul
Hilger, L. A. St. Paul
Hochfilzer, J. J. St. Paul
Hoff, Alfred St. Paul
Hoff, Peder A. St. Paul
Hoffman, Max H. St. Paul
Holcomb, J. T. St. Paul
Holcomb, O. W. St. Paul
Holl, P. M. Minneapolis
Howard, M. A. St. Paul
Howard, W. S. St. Paul
Hullsiek, H. E. St. Paul
Hultkrans, Joel C. St. Paul
Hunt, H. E. St. Paul
Ide, Arthur W. St. Paul
Ingerson, C. A. St. Paul
Jeson, J. W. St. Paul

Johnson, Asa M.....	St. Paul	Nelson, L. A.....	St. Paul	Simon, B. F.....	St. Paul
Johnson, Hartland C.....	St. Paul	Nesbit, Harold T.....	St. Paul	Simon, Geo. H.....	St. Paul
Johnson, T. H.....	St. Paul	Nichols, A. E.....	St. Paul	Skinner, H. O.....	St. Paul
Jones, D. C.....	St. Paul	Nippert, H. T.....	St. Paul	Snyder, Geo. W.....	St. Paul
Jones, E. M.....	St. Paul	Norris, E. H.....	St. Paul	Sohlberg, Olof.....	St. Paul
Kamman, Gordon R.....	St. Paul	Nye, Katherine A.....	St. Paul	Sprafka, J. M.....	St. Paul
Kannary, E. L.....	St. Paul	Nye, Lillian.....	St. Paul	Staley, J. C.....	St. Paul
Kelly, John V.....	St. Paul	O'Brien, H. J.....	St. Paul	Steen, A. H.....	Cottage Grove
Kelly, Paul H.....	St. Paul	O'Connor, I. A.....	St. Paul	Sterner, E. G.....	St. Paul
Kennedy, William.....	St. Paul	O'Connor, J. P.....	St. Paul	Sterner, O. W.....	St. Paul
Kenny, H. F.....	St. Paul	O'Connor, J. V.....	St. Paul	Stevens, F. A.....	Lake Elmo
Kesting, Herman.....	St. Paul	Oerting, Harry.....	St. Paul	Stewart, Alexander.....	St. Paul
Kistler, A. S.....	St. Paul	Ogden, Warner.....	St. Paul	Stierle, Adolph.....	St. Paul
Klein, H. N.....	St. Paul	Ohage, Justus.....	St. Paul	Stinnette, S. E.....	St. Paul
Knauff, M. K.....	St. Paul	Ohage, Justus, Jr.....	St. Paul	Stolpestad, H. L.....	St. Paul
Kvitrud, G.....	St. Paul	Olson, Chas. A.....	St. Paul	Swanson, Edwin O.....	St. Paul
Langenderfer, F. V.....	St. Paul	Ostergren, E. W.....	St. Paul	Swanson, John A.....	St. Paul
Larsen, C. L.....	St. Paul	Pearson, F. R.....	St. Paul	Sweeney, Arthur.....	St. Paul
Larson, M. L.....	St. Paul	Pedersen, A. H.....	St. Paul	Swendson, J. J.....	St. Paul
Leahy, B.....	St. Paul	Perry, C. G.....	St. Paul	Taylor, H. L.....	St. Paul
Leavenworth, R. O.....	St. Paul	Peterson, V. N.....	St. Paul	Teisberg, C. B.....	St. Paul
Leitch, Archibald.....	St. Paul	Pine, Auten A.....	St. Paul	Thauwald, C. C.....	St. Paul
Lepak, John A.....	St. Paul	Platt, J. J.....	St. Paul	Tiber, L. J.....	St. Paul
Lerche, William.....	St. Paul	Plondke, F. J.....	St. Paul	Tregilgas, H. R.....	St. Paul
Lewis, J. B.....	South St. Paul	Ramsey, W. R.....	St. Paul	Van Norman, K. H.....	St. Paul
Lewis, W. W.....	St. Paul	Richards, E. T. F.....	St. Paul	Van Slyke, Chas. A.....	St. Paul
Lick, C. L.....	St. Paul	Richardson, H. E.....	St. Paul	Von der Weyer, William.....	St. Paul
Little, W. J.....	St. Paul	Riggs, C. Eugene.....	St. Paul	Waas, Chas.....	St. Paul
Lundholm, A. M.....	St. Paul	Ritchie, H. P.....	St. Paul	Wald, R. H.....	St. Paul
McCarthy, W. R.....	St. Paul	Rogers, John T.....	St. Paul	Walker, R. E.....	St. Paul
McClanahan, J. H.....	White Bear	Rothrock, J. L.....	St. Paul	Wallinga, John H.....	St. Paul
McClanahan, T. S.....	White Bear	Rothschild, H. J.....	St. Paul	Walters, B. Frank.....	St. Paul
McCloud, C. N.....	St. Paul	Roy, Philemon.....	St. Paul	Warner, E. F.....	St. Paul
McDavitt, Thomas.....	St. Paul	Ruhberg, Geo. N.....	St. Paul	Warnock, R. W.....	St. Paul
McKeon, Owen.....	St. Paul	Rutherford, W. C.....	St. Paul	Warren, E. L.....	St. Paul
McLaren, Jennette M.....	St. Paul	Ryan, John J.....	St. Paul	Warwick, Margaret.....	St. Paul
McNevin, C. F.....	St. Paul	Satterlund, V. L.....	St. Paul	Welch, M. C.....	St. Paul
Maloney, T. J.....	St. Paul	Savage, F. J.....	St. Paul	Wheeler, M. W.....	St. Paul
Martineau, J. L.....	St. Paul	Schatz, F. J.....	St. Paul	Whitacre, J. C.....	St. Paul
Meyerding, E. A.....	St. Paul	Schoch, R. B.....	St. Paul	Whitcomb, Ed. H.....	St. Paul
Mitchell, Frederick.....	St. Paul	Schons, E.....	St. Paul	White, J. S.....	St. Paul
Molander, H. A.....	St. Paul	Schuldt, F. C.....	St. Paul	Whitmore, F. W.....	St. Paul
Morris, R. Edwin.....	St. Paul	Schulze, Albert G.....	St. Paul	Whitney, A. W.....	St. Paul
Morrissey, F. B.....	St. Paul	Schwytzer, Arnold.....	St. Paul	Williams, Clayton.....	St. Paul
Mortenson, N. G.....	St. Paul	Senkler, G. E.....	St. Paul	Winnick, J. B.....	St. Paul
Moss, Myer N.....	St. Paul	Shannon, W. R.....	St. Paul	Wold, K. C.....	St. Paul
Moynihan, T. J.....	St. Paul	Shapere, A. D.....	St. Paul	Wolfe, H. H.....	St. Paul
Murphy, E. F.....	St. Paul	Shellman, John L.....	St. Paul	Wood, H. G.....	St. Paul
Myers, Thos.....	St. Paul	Shillington, M. A.....	St. Paul	Ylvisaker, L. S.....	St. Paul
Neher, F. H.....	St. Paul	Shimonek, Anton.....	St. Paul	Zander, C. H.....	St. Paul
				Zimmerman, H. B.....	St. Paul

Washington County Medical Society

Regular meetings held on second Tuesday of the odd numbered months
Annual meeting, November

President	Freligh, E. O'B.....	Stillwater	Newman, G. A.....	Stillwater
Secretary	Josewski, R. J.....	Stillwater	Poirier, J. A.....	Forest Lake
	Brown, A. E.....	Stillwater	Sherman, C. H.....	Bayport
			Stuhr, J. W.....	Stillwater
			Thompson, V. C.....	Marine-on-St. Croix

Chisago-Pine County Medical Society

Regular meetings, second Tuesday in January, May, August and November
Annual meeting, second Tuesday in May

President	Dredge, H. P.....	Sandstone	Callahan, F. F.....	Pokegama	Stewart, R. I.....	Lindstrom
Secretary	Kelsey, C. G.....	Hinckley	Flom, A. O.....	Chisago City	Stowe, A. J.....	Rush City
	Bohling, B. S.....	Sandstone	Gunz, A. W.....	Center City	Stratte, A. K.....	Pine City
			Holmes, A. E.....	Rush City	Tilton, A. J.....	Alden
			Kelsey, C. G.....	Hinckley	Wiseman, Robert L.....	Pine City
			Paulson, C. W.....	North Branch	Zeien, Thos.....	North Branch

Central Minnesota District Medical Society

Mille Lacs, Sherburne, Isanti, Anoka and Kanabec Counties
Regular meetings, January, May and September
Annual meeting, January

President	Swenson, Charles.....	Braham	Cooney, H. C.....	Princeton	Roadman, I. M.....	Ponsford
Secretary	Cooney, H. C.....	Princeton	Dunne, Gerald P.....	Isle	Roehlke, A. B.....	Elk River
	Bossert, C. S.....	Mora	Gates, C. E.....	Anoka	Shulean, N. S.....	Cambridge
	Caine, A. T.....	Anoka	Hall, E. L.....	Princeton	Spurzem, R. J.....	Anoka
	Caley, G. R.....	Princeton	Hendenstrom, L. H.....	Cambridge	Stocking, F. F.....	Milaca
			McCann, G. C.....	Onamia	Swennes, O. S.....	Wahkon
			Norgard, H. T.....	Milaca	Swenson, Charles.....	Braham
			Peterson, A. A.....	Mora	Vrooman, F. E.....	St. Francis

St. Louis County Medical Society

St. Louis, Cook, Lake, Itasca and Carlton Counties
 Regular meetings, second Thursday of each month
 Annual meeting, second Thursday in October

President
 Magney, F. H. Duluth
 Secretary
 Anderson, H. C. Duluth
 Abbott, Wm. P. Duluth
 Adams, B. S. Hibbing
 Anderson, H. C. Duluth
 Arminen, K. V. Duluth
 Armstrong, E. L. Duluth
 Athens, A. S. Duluth
 Ayers, G. T. Ely
 Bagley, W. R. Duluth
 Barney, L. A. Duluth
 Barrett, Fred Gilbert
 Berdez, G. L. Duluth
 Bergquist, K. E. Duluth
 Blacklock, S. S. Hibbing
 Blackely, C. C. Barnum
 Boman, P. G. Duluth
 Bowen, R. L. Hibbing
 Boyer, S. H. Duluth
 Braden, A. J. Duluth
 Bradley, E. L. Duluth
 Bray, C. W. Biwabik
 Briggs, F. W. Duluth
 Brunet, L. M. River Rouge, Mich.
 Bullen, F. W. Hibbing
 Burns, H. J. Duluth
 Burns, R. L. Two Harbors
 Carstens, C. F. Hibbing
 Chapman, T. L. Duluth
 Cheney, E. L. Duluth
 Christenson, E. P. Two Harbors
 Clark, F. F. Duluth
 Collins, A. N. Duluth
 Collins, H. C. Duluth
 Cosgrove, J. H. Duluth
 Coventry, W. A. Duluth
 Crowe, J. H. Virginia
 Dahlin, I. T. Coleraine
 Daniels, H. A. Eveleth
 Davis, B. F. Duluth
 Davis, H. S. Duluth
 Doolittle, L. E. Duluth
 Doyle, Geo. C. Duluth
 Drenning, F. C. Duluth
 Eklund, E. C. Hibbing
 Eckman, P. F. Duluth
 Eisenman, W. G. Chisholm
 Ekblad, J. W. Duluth
 Eklund, W. J. Duluth
 Elias, F. J. Duluth
 Empie, W. M. Virginia
 Eppard, R. M. Cloquet
 Ewens, H. B. Virginia
 Ferreira, G. J. Aurora
 Fleming, J. Cloquet

Forbes, R. S. Duluth
 Fuerste, Frederick Proctor
 Gardner, R. D. Eveleth
 Gauthier, W. L. Virginia
 Gendron, J. F. Grand Rapids
 Gibson, A. J. Duluth
 Gilbert, J. D. Carlton
 Gillespie, M. G. Duluth
 Gillespie, N. H. Duluth
 Giroux, A. A. Duluth
 Goodman, C. E. Virginia
 Graham, David Duluth
 Graham, R. D. Duluth
 Graham, Robert Duluth
 Grawn, F. A. Duluth
 Greeley, L. Q. Duluth
 Grover, F. E. Duluth
 Haney, C. L. Duluth
 Harris, C. N. Nashwauk
 Hatch, W. E. Duluth
 Hayes, M. F. Nashwauk
 Helmark, O. E. Duluth
 Hill, F. E. Duluth
 Hirschboeck, F. J. Duluth
 Hirschfeld, M. S. Duluth
 Hovde, H. Duluth
 Hursh, M. M. Grand Rapids
 Jensen, T. J. Duluth
 Kean, N. D. Coleraine
 Keyes, C. R. Duluth
 Kiesling, I. H. Nashwauk
 King, W. S. Eveleth
 Klein, Harry Duluth
 Knapp, F. N. Duluth
 Kohlbry, C. O. Duluth
 Kraft, Peter Duluth
 Kuth, J. R. Duluth
 Laird, A. T. Nopeming
 Lenont, C. B. Virginia
 Lepak, F. J. Duluth
 Lindgren, E. I. Duluth
 Litman, Samuel N. Meadowlands
 Loofbourrow, E. H. Keewatin
 Lum, C. E. Duluth
 McComb, C. F. Duluth
 McCoy, Mary Duluth
 McDonald, A. L. Duluth
 McGiffert, E. N. Duluth
 McHaffie, O. L. Duluth
 McIntyre, E. H. Virginia
 McMurtrie, W. B. Marble
 McMurtry, W. C. Virginia
 McNutt, John R. Two Harbors
 Magie, W. H. Duluth
 Magney, F. H. Duluth
 Manley, J. R. Duluth
 Martin, T. R. Duluth
 Merriman, L. L. Duluth
 Miller, Walter H. Buhl

Miners, G. A. Deer River
 Monroe, P. B. Soudan
 More, C. W. Eveleth
 Morsman, L. W. Hibbing
 Morss, C. R. Zumbrota
 Murray, D. D. Duluth
 Nelson, E. H. Chisholm
 Nicholson, M. A. Duluth
 Olson, Albert E. Duluth
 Olson, O. S. Duluth
 Oredson, O. A. Duluth
 Pake, S. G. Duluth
 Paradine, J. Duluth
 Parker, O. W. Ely
 Payette, C. H. Duluth
 Pennie, D. F. Duluth
 Perley, A. E. Chisholm
 Powers, J. E. Duluth
 Raadquist, C. S. Hibbing
 Radtke, H. P. Chisholm
 Raibala, John Virginia
 Raiter, Franklin W. S. Cloquet
 Raiter, Roy F. Cloquet
 Reynolds, Hugh Hibbing
 Rippert, J. A. Duluth
 Robinson, J. M. Duluth
 Rood, D. C. Duluth
 Rowe, O. W. Duluth
 Rudie, P. S. Duluth
 Ryan, J. W. Duluth
 Scherer, C. A. Duluth
 Schroeder, C. H. Duluth
 Schwartz, A. H. Duluth
 Seashore, D. E. Duluth
 Shapiro, E. Z. Duluth
 Shaw, A. W. Buhl
 Slyfield, F. F. Duluth
 Smith, C. M. Duluth
 Spicer, F. W. Duluth
 Strathern, M. L. Gilbert
 Strobel, W. G. Duluth
 Stuart, A. B. Cloquet
 Sukeforth, L. A. Duluth
 Sutherland, H. N. Ely
 Tibbetts, M. H. Duluth
 Tilderquist, D. L. Duluth
 Tuohy, E. L. Duluth
 Turnbull, F. M. Duluth
 Urberg, S. E. Duluth
 Vercellini, C. E. Duluth
 Walker, A. E. Duluth
 Walters, F. R. Moose Lake
 Webster, E. E. Proctor
 Webster, H. E. Duluth
 Weirick, Howard R. Hibbing
 Wilkinson, Stella Duluth
 Winter, J. A. Duluth
 Young, T. O. Duluth
 Young, V. A. Duluth

FOURTH DISTRICT

COUNCILOR, W. H. CONdit (3 years) Minneapolis

Hennepin County Medical Society

Regular meetings, first Monday in each month excepting June, July and August
 Annual meeting, first Monday in January

President
 Geist, Emil Minneapolis
 Secretary
 La Vake, R. T. Minneapolis
 Abbott, A. W. Minneapolis
 Adair, F. L. Minneapolis
 Aling, C. P. Minneapolis
 Allen, H. W. Minneapolis
 Allison, R. G. Minneapolis
 Almquist, H. E. Minneapolis
 Anderson, A. E. Minneapolis
 Anderson, Arnt Minneapolis
 Anderson, D. D. Minneapolis
 Anderson, E. D. Minneapolis
 Anderson, Frank J. Minneapolis
 Anderson, James K. Deerwood
 Annis, H. B. Minneapolis
 Arey, H. C. Excelsior
 Arvidson, C. G. Minneapolis
 Aurand, W. H. Minneapolis

Aurness, P. A. Minneapolis
 Avery, J. F. Minneapolis
 Aylmer, A. L. Minneapolis
 Baken, Melvin P. Minneapolis
 Baker, A. T. Minneapolis
 Baker, E. L. Minneapolis
 Bakke, O. H. Minneapolis
 Baldwin, L. B. Minneapolis
 Barber, J. P. Minneapolis
 Barden, Norman. Minneapolis
 Barron, Moses Minneapolis
 Bass, G. W. Minneapolis
 Baxter, S. H. Minneapolis
 Beard, Archie Minneapolis
 Bedford, E. W. Minneapolis
 Bell, J. W., Jr. Minneapolis
 Bell, J. W., Sr. Minneapolis
 Benedict, E. E. Minneapolis
 Benjamin, A. E. Minneapolis
 Benn, F. G. Minneapolis
 Benson, R. D. Minneapolis
 Bessesen, A. N. Minneapolis

Bessesen, Al N., Jr. Minneapolis
 Bessesen, Daniel H. Minneapolis
 Bessesen, Wm. A. Minneapolis
 Bishop, Chas. W. Minneapolis
 Bissell, F. S. Minneapolis
 Blake, James Hopkins
 Blaustone, H. H. Minneapolis
 Blanton, Smiley Minneapolis
 Bockman, M. W. H. Minneapolis
 Booth, A. E. Minneapolis
 Boquist, E. T. W. Minneapolis
 Boreen, C. A. Minneapolis
 Bouman, H. A. H. Minneapolis
 Bracken, H. M. Minneapolis
 Bratrud, Arthur F. Minneapolis
 Brooks, Chas. N. Minneapolis
 Brown, E. J. Minneapolis
 Brown, E. D. Minneapolis
 Brown, R. S. Minneapolis
 Bulkley, Kenneth Minneapolis
 Butler, John Minneapolis
 Byrnes, W. J. Minneapolis

Cabot, V. S.	Minneapolis	Herbst, Wm. P.	Minneapolis	Merkert, Chas. E.	Minneapolis
Camp, Walter E.	Minneapolis	Herman, Arthur L.	Minneapolis	Merkert, G. L.	Minneapolis
Campbell, Lowell M.	Minneapolis	Hiebert, J. P.	Minneapolis	Meyer, E. L.	Minneapolis
Campbell, Robert	Minneapolis	Higgins, J. H.	Minneapolis	Michael, J. C.	Minneapolis
Carey, Jas. B.	Minneapolis	Hill, Eleanor J.	Minneapolis	Michelson, H. E.	Minneapolis
Carlaw, Chester M.	Minneapolis	Hirschfeld, F. R.	Minneapolis	Miller, F. C.	Minneapolis
Cheleen, S. J.	Minneapolis	Hoaglund, Arthur W.	Minneapolis	Moir, Wm. W.	Minneapolis
Chikler, A. A.	Minneapolis	Hobbs, C. A.	Minneapolis	Moorhead, M. B.	Minneapolis
Clark, Howard S.	Minneapolis	Hodge, S. V.	Minneapolis	Moren, Edwin	Minneapolis
Condit, W. H.	Minneapolis	Holland, A. S.	Minneapolis	Moriarity, Cecile R.	Minneapolis
Cook, H. W.	Minneapolis	Holen, T.	Minneapolis	Morrison, A. W.	Minneapolis
Corbett, J. Frank.	Minneapolis	Holm, Geo. A.	Minneapolis	Morse, John H.	Minneapolis
Cosman, E. O.	Minneapolis	Howard, Wm. H.	Minneapolis	Morton, H. McI.	Minneapolis
Crafts, L. M.	Minneapolis	Huenekens, E. J.	Minneapolis	Murphy, I. J.	Minneapolis
Cranmer, Richard R.	Minneapolis	Hughes, L. D.	Minneapolis	Murray, Wm. R.	Minneapolis
Cross, John G.	Minneapolis	Hynes, James	Minneapolis	Myers, J. A.	Minneapolis
Crume, Geo. P.	Minneapolis	Hynes, John E.	Minneapolis	Nathanson, M. H.	Minneapolis
Curtin, John F.	Minneapolis	Ikedai, Kano	Minneapolis	Neal, J. M.	Minneapolis
Cutts, Geo.	Minneapolis	Irvine, H. G.	Minneapolis	Nelson, C. P.	Owatonna
Dahl, Elmer O.	Minneapolis	Jennings, Mary H.	Minneapolis	Nelson, H. S.	Minneapolis
Dahl, John A.	Minneapolis	Jensen, M. J.	Minneapolis	Nelson, O. E.	Minneapolis
Dahlstrom, A. W.	Minneapolis	Joannides, Minas	Minneapolis	Newhart, Horace	Minneapolis
Daniel, Donald H.	Minneapolis	Johnson, A. E.	Minneapolis	Nippert, L. A.	Minneapolis
Dart, L. O.	Minneapolis	Johnson, A. Elof.	Minneapolis	Noonan, Dan F.	Minneapolis
Dezell, Earl R.	Minneapolis	Johnson, James A.	Minneapolis	Nootnagel, C. F.	Minneapolis
Deziel, G.	Minneapolis	Johnson, Julius	Minneapolis	Noran, A. N.	Minneapolis
Diehl, Harold S.	Minneapolis	Johnson, Nimrod A.	Minneapolis	Nordin, G. T.	Minneapolis
Diessner, H. D.	Minneapolis	Johnson, Odin J.	Minneapolis	Nordland, Martin	Minneapolis
Disen, C. F.	Minneapolis	Johnson, R. A.	Minneapolis	Noth, H. W.	Minneapolis
Doctor, Wm. R.	Minneapolis	Jones, H. W.	Minneapolis	Oberg, C. M.	Minneapolis
Donaldson, C. A.	Minneapolis	Jones, W. A.	Minneapolis	O'Donnell, J. E.	Minneapolis
Dorge, Richard	Minneapolis	Josewich, Alex.	Minneapolis	Olson, Frederick A.	Minneapolis
Dornblaser, H. Bright.	Minneapolis	Kennedy, C. C.	Minneapolis	Olson, G. M.	Minneapolis
Doxey, G. L.	Minneapolis	Kennedy, Jane F.	Minneapolis	Olson, Olaf A.	Minneapolis
Drake, Chas. R.	Minneapolis	Kennedy, R. R.	Minneapolis	Olson, R. G.	Minneapolis
Dreisbach, N.	Minneapolis	Kimball, H. H.	Minneapolis	Owre, Oscar	Minneapolis
Dumas, Alex G.	Minneapolis	King, E. A.	Minneapolis	Parks, A. H.	Minneapolis
Dunn, Geo. Robt.	Minneapolis	King, W. R.	Minneapolis	Patterson, W. E.	Minneapolis
Dunn, Louis	Minneapolis	Kistler, C. M.	Minneapolis	Paulsen, E. L.	Minneapolis
Dunsmoor, F. A.	Minneapolis	Kittelson, Olaf	Minneapolis	Pearce, N. O.	Minneapolis
Dutton, C. E.	Minneapolis	Knight, H. L.	Minneapolis	Pederson, Harold	Minneapolis
Egilsrud, Kristian	Minneapolis	Knight, R. R.	Minneapolis	Pederson, R. M.	Minneapolis
Ehrenberg, C. J.	Minneapolis	Knight, Ralph T.	Minneapolis	Peppard, T. A.	Minneapolis
Eisler, Edw. R.	Minneapolis	Koch, John C.	Minneapolis	Perry, Ralph St. John.	Minneapolis
Eitel, G. G.	Minneapolis	Kohler, Geo. A.	Minneapolis	Peters, R. M.	Minneapolis
Ellison, D. E.	Minneapolis	Koller, H. M.	Minneapolis	Petersen, J. R.	Minneapolis
Erb, Fred A.	Minneapolis	Koller, L. R.	Minneapolis	Petersen, Thorvald	Minneapolis
Ericson, John G.	Minneapolis	Kremer, Walter J.	Minneapolis	Peterson, O. H.	Minneapolis
Everlof, J. L.	Minneapolis	Kriedt, Daniel	Minneapolis	Peterson, Willard C.	Minneapolis
Fansler, W. A.	Minneapolis	Kucera, Wm. J.	Minneapolis	Pettit, C. W.	Minneapolis
Farr, R. E.	Minneapolis	Kusske, A. L.	New Ulm	Peyton, Wm. T.	Minneapolis
Feidt, W. W.	Minneapolis	Lajoie, J. M.	Minneapolis	Phelps, Kenneth A.	Minneapolis
Fischer, G.	Minneapolis	Lane, Laura A.	Rochester	Pineo, W. B.	Minneapolis
Fjelstad, C. Alford.	Minneapolis	Lapierre, C. A.	Minneapolis	Platou, Erling S.	Minneapolis
Fjellman, R. C.	Minneapolis	Laurent, A. A.	Minneapolis	Poehler, F. T.	Minneapolis
Fleming, A. S.	Minneapolis	La Vake, R. T.	Minneapolis	Poppe, F. H.	Minneapolis
Fleming, C. Filmore.	Minneapolis	Law, A. A.	Minneapolis	Pratt, Fred J.	Minneapolis
Flocken, Chas. F.	Minneapolis	Leavitt, H. H.	Minneapolis	Pratt, J. A.	Minneapolis
Fowler, L. Haynes.	Minneapolis	Lebowske, Jos. A.	Minneapolis	Preine, Irving A.	Minneapolis
Fox, John M.	Minneapolis	Lee, H. M.	Minneapolis	Prim, J. A.	Minneapolis
Frazen, H. G.	Minneapolis	Lee, John W.	Minneapolis	Proshek, C. E.	Minneapolis
Gammell, J. H.	Minneapolis	Leland, M. N.	Minneapolis	Quinby, Thos. F.	Minneapolis
Gardner, E. L.	Minneapolis	Lemstrom, Jarl	Minneapolis	Quist, Henry W.	Minneapolis
Geist, Emil	Minneapolis	Leonard, L. J.	Minneapolis	Reed, Charles A.	Minneapolis
Giessler, Paul W.	Minneapolis	Lind, C. J.	Minneapolis	Rees, S. P.	Minneapolis
Gilles, F. L.	Minneapolis	Lippman, H. S.	Minneapolis	Regnier, E. A.	Minneapolis
Gordon, G. J.	Minneapolis	List, Walter E.	Minneapolis	Reinertson, B. R.	Buffalo, S. D.
Gosin, D. F.	Minneapolis	Litchfield, John	Minneapolis	Reynolds, J. S.	Minneapolis
Goss, Harold L.	Minneapolis	Litzenberg, J. C.	Minneapolis	Richdorf, L. F.	Minneapolis
Grave, Floyd	Minneapolis	Logefell, Rudolph	Minneapolis	Rigler, Leo G.	Minneapolis
Green, E. K.	Minneapolis	Long, Jesse	Minneapolis	Rishmiller, J. H.	Minneapolis
Groll, S.	Minneapolis	Loomis, E. A.	Minneapolis	Rizer, R. I.	Minneapolis
Gunderson, Harley J.	Minneapolis	Lundgren, A. C.	Minneapolis	Roan, Carl M.	Minneapolis
Gunderson, Nels A.	Minneapolis	Lynch, M. J.	Minneapolis	Robb, Edw. F.	Minneapolis
Hacking, Frank	Minneapolis	Lyng, John	Minneapolis	Roberts, Thos. S.	Minneapolis
Hagen, G. L.	Minneapolis	Lysne, Henry	Minneapolis	Roberts, W. B.	Minneapolis
Haggard, G. D.	Minneapolis	McCarthy, Donald	Minneapolis	Robitshek, E. C.	Minneapolis
Hall, J. M.	Minneapolis	McCartney, Jas. S.	Minneapolis	Rochford, W. E.	Minneapolis
Hamel, Arnold L.	Minneapolis	McDaniel, Orlana	Minneapolis	Rodda, F. C.	Minneapolis
Hamel, C. E.	Minneapolis	McEachran, A.	Minneapolis	Rodgers, C. L.	Minneapolis
Hamilton, A. S.	Minneapolis	McFarland, Arthur H.	Minneapolis	Rosen, S.	Minneapolis
Hamlin, Geo. B.	Minneapolis	McGandy, R. F.	Minneapolis	Rosenwald, R. M.	Minneapolis
Hammond, A. J.	Minneapolis	McIntyre, George	Minneapolis	Rowe, Paul H.	Minneapolis
Hansen, Elmer H.	Minneapolis	McKinlay, C. A.	Minneapolis	Rudd, Henry O.	Minneapolis
Hansen, Erling	Minneapolis	McKinley, J. C.	Minneapolis	Rudell, G.	Minneapolis
Hansen, Olga	Minneapolis	McKinney, F. S.	Minneapolis	Runnerstrom, Geo. E.	Minneapolis
Hanson, H. J.	Minneapolis	McLaughlin, Jas. A.	Minneapolis	Sawatzky, Wm. A.	Minneapolis
Hare, E. R.	Minneapolis	McPheeters, H. O.	Minneapolis	Schaaf, Fred K.	Minneapolis
Harrington, C. D.	Minneapolis	MacDonald, A. E.	Minneapolis	Schefcik, J. F.	Minneapolis
Harrington, F. E.	Minneapolis	MacDonald, D. A.	Minneapolis	Scheldrup, N. H.	Minneapolis
Hartzell, Thos. B.	Minneapolis	MacDonald, I. C.	Minneapolis	Schlutz, F. W.	Minneapolis
Haverfield, Addie R.	Minneapolis	Macnie, John	Minneapolis	Schmidt, Geo. F.	Minneapolis
Hayes, J. M.	Minneapolis	Maland, C. O.	Minneapolis	Schmitt, Aaron F.	Minneapolis
Head, G. D.	Minneapolis	Mann, A. T.	Minneapolis	Schmitt, S. C.	Minneapolis
Hearn, Wm. O.	Minneapolis	Marley, W. J.	Minneapolis	Schneider, J. P.	Minneapolis
Hedback, A. E.	Minneapolis	Mariette, E.	Oak Terrace	Schussler, Otto F.	Minneapolis
Hedding, J. A.	Minneapolis	Mark, D. B.	Minneapolis	Schwartz, Virgil J.	Minneapolis
Heim, R. R.	Minneapolis	Matchan, Glen R.	Minneapolis	Schwyzler, G.	Minneapolis
Helk, H. H.	Minneapolis	Matthews, Justus	Minneapolis	Seaberg, J. A.	Minneapolis
Hendrickson, J. F.	Minneapolis	Maxefner, Stanley R.	Minneapolis	Seashore, Gilbert	Minneapolis
Henry, C. E.	Minneapolis	May, W. H.	Minneapolis	Seham, Max	Minneapolis
Henry, Myron O.	Minneapolis	Mead, Marion A.	Minneapolis	Selleseth, Iver F.	Minneapolis

Sessions, J. C. Minneapolis
 Simons, J. H. Minneapolis
 Simpson, E. D. Minneapolis
 Simpson, J. D. Minneapolis
 Sivertsen, Andrew Minneapolis
 Sivertsen, Ivar Minneapolis
 Slocumb, Maude Minneapolis
 Smith, Adam M. Minneapolis
 Smith, Homer R. Minneapolis
 Smith, Norman M. Minneapolis
 Soderlind, A. Minneapolis
 Solhaug, S. B. Minneapolis
 Souba, Fred J. Minneapolis
 Spratt, C. N. Minneapolis
 Staples, H. L. Minneapolis
 Stewart, C. A. Minneapolis
 Stomel, Joseph Minneapolis
 Strachauer, A. C. Minneapolis
 Strout, E. S. Minneapolis
 Strout, G. Elmer Minneapolis
 Stuhr, Henry C. Minneapolis
 Sundt, M. Minneapolis
 Swanson, Roy E. Minneapolis
 Sweetser, H. B., Sr. Minneapolis
 Sweetser, H. B., Jr. Minneapolis
 Sweetser, Theo. Minneapolis

Sweitzer, S. E. Minneapolis
 Swendseen, Carl G. Minneapolis
 Taft, J. O. Minneapolis
 Taft, Walter L. Minneapolis
 Tanner, Alvin C. Minneapolis
 Taylor, Rood Minneapolis
 Tennyson, Theo. Minneapolis
 Thomas, Geo. E. Minneapolis
 Thomas, Geo. H. Minneapolis
 Thomas, Gilbert J. Minneapolis
 Tingdale, A. C. Minneapolis
 Towers, F. E. Minneapolis
 Tunstead, Hugh J. Minneapolis
 Turnaciliff, D. D. Minneapolis
 Tyrrell, C. C. Minneapolis
 Ulrich, Henry L. Minneapolis
 Undine, Clyde A. Minneapolis
 Voyer, Emile O. Minneapolis
 Waldron, Carl W. Minneapolis
 Wanous, E. Z. Minneapolis
 Ward, A. W. Minneapolis
 Ward, Percy Minneapolis
 Warham, T. T. Minneapolis
 Watson, C. W. Minneapolis
 Watson, J. A. Minneapolis
 Webb, R. C. Minneapolis

Weisman, Sam Minneapolis
 Welles, H. J. Minneapolis
 Wethall, A. G. Minneapolis
 Weum, T. W. Minneapolis
 Whetstone, Mary Minneapolis
 White, S. Marx. Minneapolis
 Widen, W. F. Minneapolis
 Wilcox, Archa E. Minneapolis
 Wilcox, M. Russell. Minneapolis
 Willcutt, Clarence Minneapolis
 Williams, Robert Minneapolis
 Willson, Hugh S. Minneapolis
 Witham, C. A. Minneapolis
 Wittich, F. W. Minneapolis
 Wohlrabe, A. A. Minneapolis
 Wood, Douglas F. Minneapolis
 Woodard, F. R. Minneapolis
 Woodworth, Elizab. Minneapolis
 Wright, C. B. Minneapolis
 Wright, C. D. Minneapolis
 Wright, F. R. Minneapolis
 Wynne, H. M. N. Minneapolis
 Yoerg, O. W. Minneapolis
 Zaworski, E. A. Minneapolis
 Zierold, A. A. Minneapolis
 Ziskin, Thos. Minneapolis

Wright County Medical Society

Regular meetings, first Tuesday after first Monday quarterly
 Annual meeting, October

President
 Freed, O. J. R. Cokato
 Secretary
 Catlin, John J. Buffalo
 Catlin, John J. Buffalo
 Catlin, T. J. Buffalo
 Ellison, Frank Monticello

Freed, O. J. R. Cokato
 Harriman, L. Howard Lake
 Hawkins, E. P. Montrose
 Klaveness, E. Monticello
 Lee, J. L. Watertown
 Moffatt, A. G. Howard Lake
 Norris, G. H. Annandale
 Peterson, O. L. Cokato

Phillips, A. E. Delano
 Ridgway, A. M. Annandale
 Roholt, C. L. Waverly
 Rousseau, Victor Maple Lake
 Shrader, E. E. Watertown
 Sturges, C. J. Buffalo
 Swezey, B. F. Buffalo
 Thoresen, Th. Brooklyn, N. Y.

Meeker County Medical Society

Regular meetings, quarterly, May 15, August 15, October 15
 Annual meeting, December 15

President
 Brigham, Frank Watkins
 Secretary
 Danielson, K. A. Litchfield

Brigham, Frank Watkins
 Cutts, G. A. C. Litchfield
 Danielson, K. A. Litchfield
 Dulude, S. Dassel
 Lyman, F. V. Grove City
 O'Connor, D. C. Eden Valley

Peterson, Alfred Dassel
 Robertson, A. W. Litchfield
 Robertson, W. P. Litchfield
 Sturre, J. R. Watkins
 Wilmot, H. E. Litchfield

Stearns-Benton County Medical Society

Regular meetings, third Thursday in January, April, July and October
 Annual meeting, third Thursday in April

President
 Lewis, C. B. St. Cloud
 Secretary
 Libert, J. N. St. Cloud
 Ausman, C. F. Paynesville
 Adams, J. W. Waite Park
 Adams, L. P. Sauk Rapids
 Beaty, James H. St. Cloud
 Boehm, John C. St. Cloud
 Bowing, I. E. St. Cloud
 Brigham, C. F. St. Cloud
 Clark, Harry B. St. Cloud
 Du Bois, Julian A. Sauk Center
 Du Bois, Julian F. Sauk Center
 Fleming, T. N. St. Cloud

Freeman, W. L. St. Cloud
 Friesleben, Wm. Sauk Center
 Gelz, J. J. St. Cloud
 Goehrs, H. W. St. Cloud
 Gulde, W. C. St. Cloud
 Haberman, E. Osakis
 Hemstead, Werner St. Cloud
 Holdridge, G. A. Foley
 Jones, R. N. Richmond
 Kern, M. J. St. Cloud
 Kingsbury, E. M. Clearwater
 Kohler, D. W. St. Joseph
 Kuhlman, Aug. Melrose
 Lewis, E. J. St. Cloud
 Lewis, C. B. St. Cloud
 Libert, J. N. St. Cloud
 McDowell, J. P. St. Cloud
 McKibben, H. E. St. Cloud

Meyer, A. A. Melrose
 Moynihan, And. F. Sauk Center
 Pfaff, E. K. Shoals, Ind.
 Pilon, P. C. Paynesville
 Putney, George E. Paynesville
 Rathbun, A. M. Rice
 Rathbun, C. A. St. Cloud
 Rice, G. D. St. Cloud
 Richardson, Fred S. Belgrade
 Ridgway, Alex. Belgrade
 Sherwood, G. E. Kimball
 Stangl, Fred St. Cloud
 Stangl, P. E. St. Cloud
 Sutton, Chas. S. St. Cloud
 Sweetman, R. H. Sauk Center
 Townsend, D. Brooten
 Watson, Tolbert Albany
 Wolner, Oscar H. Gilbert

Kandiyohi-Swift County Medical Society

Regular meetings, quarterly, as called by the President
 Annual meeting, December

President
 Hodapp, R. J. Willmar
 Secretary
 Scofield, C. L. Benson
 Anderson, R. E. Atwater
 Branton, A. F. Willmar

Branton, B. J. Willmar
 Daignault, O. Benson
 Davison, P. C. Willmar
 Dowswell, W. J. Benson
 Fiksdal, M. J. Willmar
 Freeman, G. E. Willmar
 French, H. S. New London

Frost, E. H. Willmar
 Hodapp, J. R. Willmar
 Jacobs, Jno. C. Willmar
 Kaufman, Wm. Appleton
 Kolset, Carl D. Sanborn
 Rains, John M. Willmar
 Scofield, C. L. Benson

FIFTH DISTRICT

COUNCILOR, H. M. WORKMAN (1 year) Tracy

Camp Release District Medical Society

Renville, Chippewa, Lac Qui Parle, Yellow Medicine and Sibley Counties

Regular meetings, quarterly

Annual meeting, October

President

Smith, L. G. Montevideo

Secretary

Holmberg, L. J. Canby

Adams, R. C. Bird Island
 Aldrich, F. H. Belview
 Barfield, J. J. Granite Falls
 Bergh, L. N. Montevideo
 Brand, W. A. Redwood Falls
 Burns, M. A. Milan
 Bushey, M. E. Arlington
 Clay, E. M. Renville
 Cole, H. B. Redwood Falls

Crandall, A. M. Madison
 Cress, E. E. Boyd
 Eisengraeber, G. A. Los Angeles
 Flinn, B. P. Redwood Falls
 Flinn, T. E. Redwood Falls
 Flower, W. Z. Minneapolis
 Frisch, Frank P. New York
 Gaines, E. C. Buffalo Lake
 Guyer, L. G. Nopeming
 Hassett, Roger G. Bird Island
 Holmberg, L. J. Canby
 Johnson, C. M. Dawson
 Johnson, H. M. Dawson
 Kaufman, A. J. Franklin
 Kilbride, J. S. Canby
 Lee, W. N. Madison

Lima, Ludvig Montevideo
 Mee, P. H. Osseo
 Mesker, G. H. Olivia
 Mitchell, A. B. Hector
 Olson, W. P. Gaylord
 Passer, A. A. Olivia
 Penhall, F. W. Morton
 Peterson, H. E. Granite Falls
 Puffer, F. L. Bird Island
 Sanderson, A. G. Granite Falls
 Sherman, H. T. Franklin
 Smith, L. G. Montevideo
 Stemsrud, A. A. Dawson
 Walker, G. H. Austria
 Westby, N. Madison
 Zimbeck, R. D. Maynard

Redwood-Brown County Medical Society

Annual meeting, April

President

Hammermeister, Theo. F.
New Ulm

Secretary

Meierding, Wm. A. Springfield

Adams, J. L. Morgan
 Dubbe, F. H. New Ulm
 Eckstein, A. W. Comfrey
 Fritsche, A. New Ulm

Fritsche, L. A. New Ulm
 Gray, F. D. Marshall
 Hammermeister, Theo. F.
New Ulm
 Jamieson, Earl Walnut Grove
 Kiefer, M. A. Sleepy Eye
 Meierding, Wm. A. Springfield
 Pederson, O. J. Hanska
 Peterson, R. A. Vesta
 Reinecke, George F. New Ulm
 Rothenburg, J. C. Springfield

Schoch, J. L. New Ulm
 Seifert, Otto J. New Ulm
 Shrader, J. S. Springfield
 Strickler, A. F. Sleepy Eye
 Strickler, Mary Sleepy Eye
 Strickler, O. C. New Ulm
 Vogel, Jos. H. New Ulm
 Vogtel, M. A. Minneapolis
 Walker, C. C. Lambertton
 Weiser, Geo. B. New Ulm
 Wellcome, J. W. B. Sleepy Eye

Lyon-Lincoln County Medical Society

Regular meetings, May and July

Annual meeting, October

President

Jacquot, G. L. Tyler

Secretary

Workman, H. M. Tracy

Akester, Ward Marshall

Bossingham, O. N. Lake Benton
 Engh, Sigfred Cottonwood
 Ford, Burton C. Marshall
 Germs, Chas. Balaton
 Hoidale, A. D. Tracy
 Jacobsen, David J. Russell
 Jacquot, G. L. Tyler
 Jensen, J. C. Hendricks

Persons, C. E. Marshall
 Robertson, J. B. Cottonwood
 Sanderson, E. T. Minneota
 Thordarson, Theo. Minneota
 Vadheim, A. L. Tyler
 Valentine, W. H. Tracy
 Workman, H. M. Tracy
 Workman, W. G. Tracy

SIXTH DISTRICT

COUNCILOR, F. R. WEISER (2 years) Windom

Southwestern Minnesota Medical Society

Pipestone, Rock, Murray, Nobles, Cottonwood and Jackson Counties

Regular meetings, May and November

Annual meeting, November

President

Hilger, J. M. Iona

Secretary

McKeown, E. G. Pipestone

Arnold, E. W. Adrian
 Atkins, G. L. Jackson
 Basinger, Harvey R.
Mountain Lake
 Benjamin, W. G. Pipestone
 Bong, J. H. Jasper
 Brown, A. H. Pipestone
 Chadbourn, A. G. Heron Lake
 Cress, P. J. Ellsworth
 De Boer, Herman. Edgerton
 Ditmeier, L. M. Gerber. Jasper
 Dolan, C. P. Worthington
 Doms, H. C. Slayton

Doms, Wm. Woodstock
 Dudley, J. H. Windom
 Golden, C. M. Tyler
 Halloran, Walter Jackson
 Hilger, J. M. Iona
 Hitchings, W. S. Lakefield
 Johnson, Ellsworth Windom
 Keeling, F. L. Lakefield
 Kooker, H. J. Hills
 Knudtson, H. M. Browerville
 Leebens, J. H. Lismore
 Lowe, Thos. Pipestone
 McCrea, Jas. Fulda
 McKeown, E. G. Pipestone
 Manson, F. M. Worthington
 May, C. C. Adrian
 Metcalf, F. W. Fulda
 Mork, B. O. Worthington
 Nusbaum, W. H. Storm Lake, Ia.
 Patterson, W. E. Westbrook

Piper, Wm. A. Mountain Lake
 Portman, W. C. Jackson
 Richardson, W. E. Pipestone
 Richmond, Chas. D. Jeffers
 Rose, J. T. Lakefield
 Sherman, C. L. Luverne
 Slater, S. A. Worthington
 Smallwood, J. T. Worthington
 Sogge, L. Windom
 Stanley, C. R. Worthington
 Taylor, Wm. J. Pipestone
 Thorson, E. O. Luverne
 Tiedeman, I. D. Heron Lake
 Tofte, Josephine Fisher
 Waller, Jas. D. Wilmont
 Watson, F. G. Worthington
 Weiser, F. R. Windom
 Williams, A. B. Worthington
 Williams, L. A. Slayton
 Wright, C. O. Luverne

Blue Earth Valley Medical Society

Martin and Faribault Counties

Regular meetings, set by Program Committee

Annual meeting, fourth Thursday in May

President
Gough, W. H. Granada
Secretary
Hunt, R. C. Fairmont
Bailey, H. B. Ceylon
Best, F. E. Wells
Boysen, H. Truman
Broberg, J. A. Blue Earth
Butz, J. A. Monterey

Chambers, W. C. Blue Earth
Cooper, M. D. Winnebago
Farrish, R. C. Sherburn
Gough, W. H. Granada
Henderson, A. J. Kiester
Holm, P. Wells
Herman, S. Welcome
Hunt, F. N. Fairmont
Hunt, R. C. Fairmont
Hunte, A. F. Truman

Jacobs, A. C. Elmore
Johnson, H. P. Fairmont
Logan, F. W. Blue Earth
Luedtke, G. H. Fairmont
McGroarty, J. J. Easton
Mills, J. W. Winnebago City
Richardson, W. J. Fairmont
Silvernail, F. Elmore
Sybilrud, H. W. Bricelyn
Wilson, C. E. Blue Earth

Wantonwan County Medical Society

Regular meetings, on call

Annual meeting, first week in December

President
Thompson, Albert St. James
Secretary
Grimes, H. B. Madelia

Bregel, F. L. St. James
Grimes, H. B. Madelia
Hagen, O. E. Butterfield

McCarthy, W. J. Madelia
Ternstrom, O. H. Minneapolis
Thompson, Albert St. James

SEVENTH DISTRICT

COUNCILOR, F. A. DODGE, M.D. (3 years) Le Sueur

Nicollet-Le Sueur County Medical Society

Regular meetings, June, September and December

Annual meeting, December

President
Ericson, Swan Le Sueur
Secretary
Baskett, George T. St. Peter
Aitkens, H. B. Le Sueur Center
Baskett, Geo. T. St. Peter

Baskett, Olive T. St. Peter
Behmler, Fred W. Appleton
Covell, W. W. St. Peter
Daniels, J. W. St. Peter
Dodge, F. A. Le Sueur
Ericson, S. Le Sueur
Fisher, J. M. St. Peter

Le Clerc, J. E. Le Sueur
McDougald, D. W. Minneapolis
Mellicke, W. A. Nicollet
Phelps, R. M. St. Peter
Smith, E. F. St. Peter
Strathern, F. P. St. Peter
Woodworth, L. F. Le Sueur Center

McLeod County Medical Society

Regular meetings, quarterly

Annual meeting, January

President
Schmidt, W. R. Glencoe
Secretary
Axilrod, D. L. Hutchinson

Axilrod, D. L. Hutchinson
Bolles, D. W. Long Beach, Cal.
Clair, J. B. Winsted
Clement, J. E. Lester Prairie
Holm, H. H. Glencoe
Jellison, E. R. New Auburn
Klima, W. W. Stewart

Kohler, F. G. Minneapolis
Langhoff, A. H. Glencoe
Saar, W. G. Hutchinson
Schmidt, W. R. Glencoe
Scholpp, O. W. Hutchinson
Sheppard, Fred Hutchinson
Sheppard, P. E. Hutchinson

Scott-Carver Medical Society

Regular meetings, first Thursday in March, June, September and December

Annual meeting, first Thursday in December

President
Bohland, F. J. von... Belle Plaine
Secretary
Reiter, H. W. Shakopee
Bohland, F. J. von... Belle Plaine
Buck, Fred H. Shakopee

Fischer, H. P. Shakopee
Fischer, P. M. Shakopee
Hebeisen, M. B. Carver
Henriksen, H. G. Elko
Juergens, H. M. Belle Plaine
McKeon, James St. Paul
Maertz, W. F. New Prague

Meyer, P. S. Belle Plaine
Moloney, G. R. Belle Plaine
Morris, F. J. Prior Lake
Novak, Edw. E. New Prague
Phillips, Wm. H. Jordan
Reiter, H. W. Shakopee
Schneider, H. A. Jordan

Goodhue County Medical Society

Annual meeting, first Tuesday in January

President
Werner, N. L. Red Wing
Secretary
Smith, M. W. Red Wing
Aanes, A. M. Red Wing

Anderson, J. V. Red Wing
Anderson, S. H. Red Wing
Bjorgo, C. W. Cannon Falls
Claydon, L. E. Red Wing
Conley, Alva Cannon Falls
Cremer, M. H. Red Wing
Cremer, P. H. Hastings
Gausemel, S. D. Goodhue

Johnson, A. E. Red Wing
Jones, A. W. Red Wing
Kretschmar, K. E. Los Angeles
McGuigan, H. T. Red Wing
Sawyer, H. P. Goodhue
Smith, M. W. Red Wing
Steffens, L. A. Red Wing
Werner, N. L. Red Wing

Rice County Medical Society

Regular meetings quarterly, as called
Annual meeting, December

President	Hanson, A. M.....Faribault	Robilliard, C. M.....Faribault
Robilliard, W. H.....Faribault	Haskins, J. L.....Northfield	Robilliard, W. H.....Faribault
Secretary	Huxley, F. R.....Faribault	Rumpf, C. W.....Faribault
Traeger, C. A.....Faribault	Kanne, C. W.....Faribault	Rumpf, W. H.....Faribault
Babcock, F. M.....Northfield	Lee, W. P.....Northfield	Smith, P. A.....Faribault
Beede, Ethel.....Faribault	Lexa, F. J.....Lonsdale	Theissen, W. N.....Faribault
Davis, F. U.....Faribault	McBroom, D. E.....Faribault	Traeger, C. A.....Faribault
Field, Merton.....Northfield	Mayland, M. L.....Faribault	Warren, F. S.....Faribault
Haessly, S. B.....Faribault	Morse, W. E. H.....Morristown	Warren, J. W.....Faribault
	Moses, Joseph, Jr.....Northfield	Wilson, Warren.....Northfield
	Plonske, C. J.....Faribault	Wilson, W. E.....Northfield

Wabasha County Medical Society

Annual meeting, first Thursday after first Monday in July

President	Bayley, E. H.....Lake City	Gutsell, R. S.....Zumbro Falls
Bowers, H. E.....Lake City	Bowers, H. E.....Lake City	Radabaugh, R. C.....Hastings
Secretary	Cochrane, W. J.....Lake City	Replogle, W. H.....Wabasha
Wilson, W. F.....Lake City	Dempsey, D. P.....Kellogg	Slocumb, J. A.....Plainview
	Fleischhauer, D. S.....Wabasha	Sutton, L. F.....Mazeppa
	French, E. A.....Plainview	Wilson, W. F.....Lake City

EIGHTH DISTRICT

COUNCILOR, W. F. BRAASCH, M.D. (2 years).....Rochester

Blue Earth County Medical Society

Regular meetings, last Monday in each month
Annual meeting, last Monday in December

President	Dahl, Gerhard A.....Mankato	Lloyd, Hiram J.....Mankato
Kelly, T. C.....Mankato	Denman, Austin V.....Mankato	Merrill, James E.....Amboy
Secretary	Edwards, Ralph T.....Elysian	Miller, Victor.....Mankato
Stillwell, W. C.....Mankato	Franchere, Fred W..Lake Crystal	O'Connor, Patrick H.....Amboy
Andrews, John W.....Mankato	Fugina, Geo. R.....Mankato	Osborn, Lida.....Mankato
Andrews, Roy N.....Mankato	Hielscher, Helen H.....Mankato	Schlesselman, George.....Good Thunder
Arnold, James E..Vernon Center	Hielscher, Julian A.....Mankato	Schlesselman, J. T.....Mankato
Benham, Edward W.....Mankato	Holbrook, John S.....Mankato	Schmidt, Paul A.....Mapleton
Black, William.....Mankato	Holman, Carl J.....Mankato	Schmer, Alphonse E. J..Mankato
Cosgriff, J. A.....Mankato	James, John H.....Mankato	Stillwell, W. C.....Mankato
	Kelly, Thos. C.....Mankato	Wentworth, Albert J.....Mankato
	Kemp, Alphonse F.....Mankato	Williams, Hugh O...Lake Crystal
	Liedloff, Adolph G.....Mankato	

Houston-Fillmore County Medical Society

Regular meetings, May, August and October
Annual meeting, October

President	Drake, F. A.....Lanesboro	Nass, H. A.....Mabel
Eby, Cyrus B.....Spring Valley	Eby, Cyrus B.....Spring Valley	Nelson, M. S.....Granite Falls
Secretary	Fischer, O. F.....Houston	Ongard, C. K.....Halstad
Fischer, O. F.....Houston	Helland, G. M.....Spring Grove	Ongard, L. K.....Houston
Anderson, Norman E...Harmony	Helland, J. W.....Spring Grove	Rhines, D. C.....Caledonia
Browning, W. E.....Caledonia	Kibbe, O. A.....Canton	Sather, E. R.....Alexandria
Christianson, H. W.....Wykoff	Kierland, P. E.....Alexandria	Tierney, C. M.....Granger
Clifton, Theo. A.....Chatfield	Lannin, J. C.....Mabel	Utey, J. O.....Montrose
Collins, J. S.....Wabasha	Love, Geo. A.....Preston	Williams, R. V.....Rushford
	Nannestad, R. F.....Lanesboro	Woodruff, C. W.....Chatfield

Mower County Medical Society

Regular meetings, last Thursday of every month
Annual meeting, last Thursday of November

President	Cobb, Willis F.....Lyle	McKenna, J. K.....Austin
Hertel, G. E.....Austin	Coleman, F. B.....Lyle	Melzer, G. R.....Lyle
Secretary	Grise, W. B.....Austin	Mitchell, R. S.....Austin
Lommen, P. A.....Austin	Hegge, C. A.....Austin	Morrow, J. J.....Grand Meadow
Allen, A. W.....Austin	Hegge, O. H.....Austin	Morse, M. P.....LeRoy
Allen, C. C.....Austin	Henslin, A. E.....LeRoy	Schottler, G. J.....Dexter
	Hertel, G. E.....Austin	Shipley, H. M.....Adams
	Leck, C. C.....Austin	Torkelson, P. T.....Lyle
	Lommen, P. A.....Austin	Warren, C. L.....LeRoy

Dodge County Medical Society

No regular meetings
Annual meeting, second Wednesday in August

President	Belt, Wallace E....Dodge Center	Harrison, Elmer E..West Concord
Smith, F. D.....Kasson	Bigelow, Chas. E...Dodge Center	Smith, Frank D.....Kasson
Secretary	Clifford, Frank F..West Concord	Way, Osman F.....Claremont
Bigelow, C. E.....Dodge Center		

Olmsted County Medical Society

Regular meetings, second Wednesday in April, June, September and December

Annual meeting, second Wednesday in December

President

Stevens, Geo.Byron

Secretary

Piper, M. C.Rochester

Adams, S. Franklin....Rochester
 Adson, Alfred W.....Rochester
 Allen, Roy Wm.....Rochester
 Allen, Wilson A.....Rochester
 Amberg, Samuel.....Rochester
 Anderson, C. M.....Rochester
 Asbury, Eslie.....Rochester
 Asbury, J. T.....Rochester
 Ash, W. A.....Rochester
 Balfour, Donald C.....Rochester
 Barborka, C. J.....Rochester
 Barges, J. Arnold.....Rochester
 Barnes, A. R.....Rochester
 Becker, Samuel Wm.....Rochester
 Benedict, William L.....Rochester
 Bergen, Ralph D.....Rochester
 Berkman, David M.....Rochester
 Blackford, L. M.....Rochester
 Bliss, John Herbert.....Rochester
 Bonta, M. B.....Rochester
 Boothby, Walter M.....Rochester
 Bothe, Fred A.....Rochester
 Bowing, Harry H.....Rochester
 Braasch, William F.....Rochester
 Brading, E. T.....Rochester
 Broders, Albert C.....Rochester
 Brown, George E.....Rochester
 Brown, P. W.....Rochester
 Bueerman, Winifred Henry.....Rochester

Buie, L. A.....Rochester
 Bumpus, Herman C.....Rochester
 Burden, Verne G.....Rochester
 Burnes, Arthur.....Rochester
 Carman, Russell Daniel.....Rochester
 Cathcart, E. P.....Rochester
 Chambers, Stanley O.....Rochester
 Cobb, Donnell B.....Rochester
 Collins, Harry A.....Rochester
 Comfort, M. W.....Rochester
 Conner, H. M.....Rochester
 Constans, Geo. M.....Rochester
 Counsellor, Virgil S.....Rochester
 Craig, Wm. McK.....Rochester
 Crane, W. W., Jr.....Rochester
 Crenshaw, John L.....Rochester
 Crewe, John E.....Rochester
 Culligan, J. M.....Rochester
 Culligan, L. C.....Rochester
 Daly, Joseph.....Rochester
 Davis, A. C.....Rochester
 Delamere, G. D.....Rochester
 Desjardins, Arthur U.....Rochester
 Dixon, C. F.....Rochester
 Dixon, R. K.....Rochester
 Dobson, Herbert Victor.....Rochester
 Dolder, Felix C.....Eyota
 Doyle, John E.....Rochester
 Drips, D. G.....Rochester
 Dunlap, H. F.....Rochester
 Dunn, H. L.....Rochester
 Ebert, Joseph William.....Rochester
 Espenlaub, G. H.....Rochester
 Eusterman, Geo. B.....Rochester
 Everts, Arrah B.....Rochester
 Faust, L. S.....Rochester
 Fawcett, Chas. E.....Stewartville
 Figi, F. A.....Rochester
 Finney, W. P.....Rochester
 Flothow, Paul G.....Rochester
 Ford, Frances A.....Rochester

Forsberg, Carl Wm....Rochester
 Freed, C. F.....Rochester
 Gaarde, Fred W.....Rochester
 Garvin, John Day.....Rochester
 Giffin, H. Z.....Rochester
 Gipner, J. F.....Rochester
 Goeckerman, W. H.....Rochester
 Granger, Charles T.....Rochester
 Green, Carl Hartley.....Rochester
 Greene, Earl I.....Rochester
 Grob, Otto.....Rochester
 Haines, S. F.....Rochester
 Hallberg, C. A.....Rochester
 Hallenbeck, Dorr F.....Rochester
 Hanson, W. Arthur.....Rochester
 Hargis, E. H.....Rochester
 Harrington, Ethel R.....Rochester
 Harshbarger, Isaac L.....Rochester
 Hartman, Howard I.....Rochester
 Hauser, E. D. W.....Rochester
 Heetderks, D. C.....Rochester
 Helmholz, H. F.....Rochester
 Hempstead, B. E.....Rochester
 Hench, Philip S.....Rochester
 Henderson, Earl F.....Rochester
 Henderson, Melvin S.....Rochester
 Hendricks, Wm. A.....Rochester
 Heyerdale, Oscar C.....Rochester
 Holloway, J. K.....Rochester
 Horwitz, Alec.....Rochester
 Houck, K. H.....Rochester
 Huffman, L. D.....Rochester
 Hufford, A. R.....Rochester
 Hunt, Verne C.....Rochester
 Jepson, P. N.....Rochester
 Johnson, A. C.....Rochester
 Johnson, Henry P.....Rochester
 Jones, H. T.....Rochester
 Joyce, George T.....Rochester
 Judd, Edward Starr.....Rochester
 Keith, N. M.....Rochester
 Kennedy, Roger L. J.....Rochester
 Kent, George B.....Rochester
 Kernohan, J. W.....Rochester
 Kilbourne, Arthur F.....Rochester
 Kilfoy, E. J.....Rochester
 Kilgore, Allen M.....Rochester
 Kilgore, F. H.....Rochester
 Killins, Wendell A.....Rochester
 Knight, Mary S.....Rochester
 Lapp, Victor R.....Rochester
 Latchford, J. K.....Rochester
 Leech, Chas. Hoyt.....Rochester
 Lemon, Willis S.....Rochester
 Lillie, Harold I.....Rochester
 Lillie, Walter I.....Rochester
 Linton, William B.....Rochester
 Logan, Archibald H.....Rochester
 Long, W. H.....Rochester
 Luden, Georgine.....Rochester
 Lundy, John S.....Rochester
 Lyday, R. O.....Rochester
 McKaig, Carle B.....Pine Island
 McQuiggan, M. R.....Rochester
 McVicar, Chas. S.....Rochester
 Madsen, L. J.....Rochester
 Magath, T. B.....Rochester
 Mahle, A. E.....Rochester
 Malloy, J. F.....Rochester
 Marsh, Fred Eugene.....Rochester
 Marquis, W. James.....Rochester
 Masson, D. M.....Rochester
 Masson, James C.....Rochester
 Mayfield, A. L.....Rochester
 Mayo, Charles H.....Rochester
 Mayo, William J.....Rochester
 Maytum, C. K.....Rochester
 Melson, Oliver C.....Rochester

Mentzer, S. H.....Rochester
 Merrill, E. Forest.....Rochester
 Meyerding, Henry W.....Rochester
 Moersch, Frederick P.....Rochester
 Moersch, H. J.....Rochester
 Moore, Alex B.....Rochester
 Morse, Harry D.....Rochester
 Morton, Chas. E.....Rochester
 Muhme, N. B.....Rochester
 Murphy, A. B.....Rochester
 Mussey, Robert B.....Rochester
 Nagel, G. W.....Rochester
 Nelson, Marquie O.....Rochester
 New, Gordon B.....Rochester
 Ochsenhirt, N. C.....Rochester
 Offutt, Susan R.....Rochester
 Ohlinger, Lorin B.....Rochester
 O'Leary, Paul A.....Rochester
 Olson, Ernest A.....Pine Island
 Omohundro, Miles P.....Rochester
 Parker, B. R.....Rochester
 Parker, H. L.....Rochester
 Parker, J. William.....Rochester
 Parker, S. T.....Rochester
 Pemberton, John deJ.....Rochester
 Perry, C. C.....Rochester
 Peterman, M. G.....Rochester
 Piper, Monte C.....Rochester
 Plankers, A. G.....Rochester
 Plummer, H. S.....Rochester
 Plummer, W. A.....Rochester
 Pollock, Lee W.....Rochester
 Potter, J. C.....Rochester
 Powell, L. D.....Rochester
 Prangen, Avery D.....Rochester
 Prickman, L. E.....Rochester
 Pulford, DeLos Schuyler (Jr.).....Rochester

Randall, L. M.....Rochester
 Reid, J. Spence.....Rochester
 Rivers, A. B.....Rochester
 Robertson, H. E.....Rochester
 Rockwood, Paul Reed.....Rochester
 Rohrer, C. J.....Rochester
 Rosenow, Edward C.....Rochester
 Rowntree, L. G.....Rochester
 Sager, Wm. W.....Rochester
 Sanford, Arthur H.....Rochester
 Schmitt, E. O. G.....Rochester
 Schulz, Irwin.....Rochester
 Sheldon, Walter D.....Rochester
 Simon, H. E.....Rochester
 Sistrunk, Walter E.....Rochester
 Smith, F. L.....Rochester
 Snell, A. M.....Rochester
 Stacy, Leda June.....Rochester
 Stark, W. B.....Rochester
 Steven, George.....Byron
 Stevens, J. P.....Rochester
 Stinson, J. W.....Rochester
 Sutherland, C. G.....Rochester
 Swan, Theo. S.....Rochester
 Synhoist, A. P.....Rochester
 Thompson, J. W.....Rochester
 Underhill, M. S.....Rochester
 Vinson, Porter P.....Rochester
 Von Lackum, W. H.....Rochester
 Wagener, H. P.....Rochester
 Walters, H. W.....Rochester
 Webber, I. M.....Rochester
 Weir, J. F.....Rochester
 Wilder, Russell M.....Rochester
 Wilkinson, H. F.....Rochester
 Williamson, Carl S.....Rochester
 Willis, Fredrick A.....Rochester
 Wolman, Henry W. F.....Rochester
 Yoakem, H. H.....Rochester
 Ziegler, Lloyd H.....Rochester

Waseca County Medical Society

Annual meeting, second Monday in December

President

Miller, H. A.....Waseca

Secretary

Gallagher, B. J.....Waseca

Blanchard, H. G.....Waseca
 Chamberlin, W. A.....Waseca
 Cory, W. M.....Waterville
 Gallagher, B. J.....Waseca
 Hagen, H. O.....New Richland

Leopard, B. A.....New Richland
 McIntire, H. M.....Waseca
 Miller, H. A.....Waseca
 O'Hara, J. J.....Janesville
 Swartwood, F. A.....Waseca

Winona County Medical Society

Regular meetings, second Tuesday in January, April, July and October

Annual meeting, second Tuesday in January

President
Risser, E. D.....Winona
Secretary
Steiner, I. W.....Winona
Adler, S. W.....Winona
Baer, H. C.....St. Charles
Benoit, F. T.....Winona
Clay, F. H.....St. Charles

Heise, W. F. C.....Winona
Keyes, E. D.....Winona
Leicht, O.Winona
Lichtenstein, H.Winona
Lindsay, W. V.....Winona
McLaughlin, E. M.....Winona
Nauth, W. W.....Winona
Neumann, C. A.....Lewiston
Neumann, W. H...Sheboygan, Wis.

Pritchard, D. B.....Winona
Risser, E. D.....Winona
Robbins, C. P.....Winona
Rosenberry, B. P.....Winona
Schaefer, S.Winona
Schnarrenberger, G...Rollingstone
Scott, J. W.....St. Charles
Steiner, I. W.....Winona
Tweedy, G. J.....Winona

Freeborn County Medical Society

Regular meetings upon call of members

Annual meeting, December 17

President
Von Berg, J. P.....Albert Lea
Secretary
Gamble, J. W.....Albert Lea
Branham, D. S.....Albert Lea

Burns, H. D.....Albert Lea
Buturff, C. R.....Freeborn
Calhoun, F. W.....Albert Lea
Folken, F. G.....Albert Lea
Freeman, J. P.....Glenville
Gamble, J. W.....Albert Lea
Gamble, P. M.....Albert Lea
Gullixson, A.Albert Lea

Kamp, B. A.....Albert Lea
King, W. I.....Albert Lea
Nannestad, J. R.....Albert Lea
Palmer, C. F.....Albert Lea
Palmer, W. L.....Albert Lea
Shultz, J. A.....Albert Lea
Vollum, E. O.....Albert Lea
Von Berg, J. P.....Albert Lea

Steele County Medical Society

Regular meetings, second Tuesday in February, April, June, August and October

Annual meeting, December 9

President
Stewart, A. B.....Owatonna
Secretary
Senn, E. W.....Owatonna

Andrist, J. W.....Owatonna
Daily, W. J.....Bloomington
Ertel, E. Q.....Ellendale
Gamble, R. M.....Ellendale
Hart, A. B.....Owatonna
McIntyre, J. A.....Owatonna
Melby, B.Bloomington

Peterson, C.Owatonna
Quigley, T. C.....Owatonna
Senn, E. W.....Owatonna
Smersh, F. M.....Owatonna
Smersh, J. F.....Owatonna
Stewart, A. B.....Owatonna
Thimsen, N. C...Bloomington

ALPHABETICAL ROSTER

Aanes, A. M. Red Wing
 Abbott, A. W. Minneapolis
 Abbott, J. S. St. Paul
 Abbott, Wm. P. Duluth
 Aborn, W. H. Hawley
 Abramovich, J. H. St. Paul
 Adair, F. L. Minneapolis
 Adams, B. S. Hibbing
 Adams, J. L. Morgan
 Adams, J. W. Waite Park
 Adams, L. P. Sauk Rapids
 Adams, R. C. Bird Island
 Adams, S. Franklin. Rochester
 Adkins, C. M. Grygla
 Adler, Stuart Welsh. Winona
 Adson, A. W. Rochester
 Agnew, Allen T. International Falls
 Ahlfs, J. A. Erskine
 Ahrens, A. E. St. Paul
 Ahrens, A. H. St. Paul
 Ahrens, E. G. Ah Gwah Ching
 Aitkens, H. B. Le Sueur Center
 Akester, Ward Marshall
 Alberts, Max W. St. Paul
 Alden, J. F. St. Paul
 Aldes, Harry St. Paul
 Aldrich, F. H. Belview
 Alexander, F. H. St. Paul
 Aling, C. P. Minneapolis
 Allen, A. W. Austin
 Allen, Chas. C. Austin
 Allen, F. A. Crosby
 Allen, F. H. Staples
 Allen, H. W. Minneapolis
 Allen, Mason St. Paul
 Allen, Roy William. Rochester
 Allen, W. A. Rochester
 Allison, R. G. Minneapolis
 Allquist, H. E. Minneapolis
 Amberg, Samuel Rochester
 Amundson, A. E. Little Falls
 Anderson, A. E. Minneapolis
 Anderson, A. G. Minneapolis
 Anderson, Arnold S. Ah Gwah Ching
 Anderson, C. M. Rochester
 Anderson, David D. Minneapolis
 Anderson, Edward Dyer. Minneapolis
 Anderson, Frank J. Minneapolis
 Anderson, H. C. Duluth
 Anderson, J. K. Deerwood
 Anderson, J. V. Red Wing
 Anderson, Norman E. Harmony
 Anderson, R. E. Atwater
 Anderson, S. H. Red Wing
 Anderson, W. S. Minneapolis
 Anderson, W. T. St. Paul
 Andrews, J. W. Mankato
 Andrews, R. N. Mankato
 Andrist, J. W. Owatonna
 Annis, H. B. Minneapolis
 Archibald, Frank M. Mahanomen
 Arends, A. L. St. Paul
 Arey, H. C. Excelsior
 Arminen, K. V. Duluth
 Armstrong, E. L. Duluth
 Armstrong, J. M. St. Paul
 Arnold, E. W. Adrian
 Arnold, James E. Vernon Center
 Aune, Martin Minneapolis
 Arnquist, A. S. St. Paul
 Arnson, J. M. Graceville
 Arouni, Khalil St. Paul
 Arvidson, C. G. Minneapolis
 Arzt, C. P. St. Paul
 Asbury, Elsie Rochester
 Asbury, J. T. Rochester
 Ash, Wilfrid Anthony. Rochester
 Athens, A. S. Duluth
 Atkins, G. L. Jackson
 Aurd, W. H. Minneapolis
 Aurness, P. A. Minneapolis
 Ausman, Carl F. Paynesville
 Avery, J. Fowler. Minneapolis
 Axilrod, D. L. Hutchinson
 Aylmer, A. L. Minneapolis
 Ayres, G. T. Ely
 Babcock, F. M. Northfield
 Backe, S. H. Kenyon
 Bacon, Donald K. St. Paul
 Bacon, Knox St. Paul
 Bacon, L. C. St. Paul
 Badeaux, G. I. Brainerd
 Baer, H. C. St. Charles
 Bagley, W. R. Duluth

Bailey, H. B. Ceylon
 Baken, Melvin P. Minneapolis
 Baker, A. C. Fergus Falls
 Baker, Alfred T. Minneapolis
 Baker, E. L. Minneapolis
 Bakke, O. H. Minneapolis
 Balcome, F. E. St. Paul
 Baldwin, L. B. Minneapolis
 Balfour, D. C. Rochester
 Ball, C. R. St. Paul
 Barber, J. P. Minneapolis
 Barborka, C. J. Rochester
 Barden, Norman Minneapolis
 Barfield, J. J. Granite Falls
 Bargen, J. Arnold. Rochester
 Barnes, A. R. Rochester
 Barney, L. A. Duluth
 Barrett, Fred Gilbert
 Barron, Moses Minneapolis
 Barry, L. W. St. Paul
 Barsness, Nellie St. Paul
 Basinger, Harvey R. Mountain Lake
 Baskett, George T. St. Peter
 Baskett, Olive T. St. Peter
 Bass, G. W. Minneapolis
 Bates, B. V. Wheaton
 Baxter, S. H. Minneapolis
 Bayley, E. H. Lake City
 Beadie, W. D. Cannon Falls
 Beals, Hugh St. Paul
 Beard, Archie H. Minneapolis
 Beaty, J. H. St. Cloud
 Becker, Samuel William. Rochester
 Bedford, E. W. Minneapolis
 Beede, Ethel Faribault
 Behm, Fred W. Appleton
 Beise, R. A. Brainerd
 Bell, C. C. St. Paul
 Bell, J. W. Minneapolis
 Bell, J. Warren, Jr. Minneapolis
 Belt, W. E. Dodge Center
 Benedict, E. E. Minneapolis
 Benedict, W. L. Rochester
 Benepe, L. M. St. Paul
 Benham, E. W. Mankato
 Benjamin, A. E. Minneapolis
 Benn, F. G. Minneapolis
 Bennion, P. H. St. Paul
 Benoit, F. T. Winona
 Benson, R. D. Minneapolis
 Bentley, Norman P. St. Paul
 Berdez, G. L. Duluth
 Bergen, Otto Clinton
 Bergen, Ralph D. Rochester
 Bergh, L. N. Montevideo
 Berghheim, M. C. Hawley
 Bergman, O. B. Janesville
 Bergquist, K. E. Duluth
 Berkman, D. M. Rochester
 Bernard, B. C. Thief River Falls
 Berrisford, Paul D. St. Paul
 Bertelson, O. L. Crookston
 Bessenes, A. N., Sr. Minneapolis
 Bessenes, A. N., Jr. Minneapolis
 Bessenes, Daniel H. Minneapolis
 Bessenes, W. A. Minneapolis
 Best, F. E. Wells
 Biedermann, Jacob Thief River Falls
 Bigelow, C. E. Dodge Center
 Binger, H. E. St. Paul
 Birnberg, T. L. St. Paul
 Bishop, Chas. Wesley. Minneapolis
 Bissell, F. S. Minneapolis
 Bjorgo, C. W. Cannon Falls
 Black, Wm. Mankato
 Blackford, Launcelot Minor. Rochester
 Blacklock, S. S. Hibbing
 Blake, Jas. Hopkins
 Blakely, C. C. Barnum
 Blanchard, H. G. Waseca
 Blanton, Smiley Minneapolis
 Blaustone, Henry H. Minneapolis
 Blegen, H. M. Warren
 Bliss, John Herbert. Rochester
 Rock, R. A. St. Paul
 Bockman, M. W. H. Minneapolis
 Boeckmann, Edward St. Paul
 Boeckmann, Egil St. Paul
 Boehm, J. C. St. Cloud
 Bohland, E. H. St. Paul
 Bohland, F. J. von. Belle Plaine
 Bohling, B. S. Sandstone

Bole, R. S. St. Paul
 Boleyn, E. S. Stillwater
 Bolles, D. W. Long Beach, Cal.
 Bolsta, Chas. Ortonville
 Bolstad, H. C. St. Paul
 Boman, P. G. Duluth
 Bone, Merle Kelliher
 Bong, J. H. Jasper
 Bonta, M. B. Rochester
 Booth, A. E. Minneapolis
 Boothby, W. M. Rochester
 Boquist, E. T. W. Minneapolis
 Boreen, C. A. Minneapolis
 Borreson, B. Remer
 Bossert, C. S. Mora
 Bossingham, O. N. Lake Benton
 Bosworth, Robinson St. Paul
 Bothe, Frederick Augustus. Rochester
 Bottolfson, B. T. Moorhead
 Bouma, L. R. St. Paul
 Bouman, H. A. Minneapolis
 Bowen, R. L. Hibbing
 Bowers, J. T. Thief River Falls
 Bowing, H. H. Rochester
 Bowing St. Cloud
 Boyer, S. H. Duluth
 Boysen, H. Truman
 Boysen, P. Pelican Rapids
 Braasch, Wm. F. Rochester
 Brabec, F. G. Perham
 Bracken, H. M. New York City
 Braden, A. J. Duluth
 Brading, Edward Thurston. Rochester
 Bradley, E. L. Duluth
 Brand, G. D. St. Paul
 Brand, W. A. Redwood Falls
 Branham, D. S. Albert Lea
 Branton, A. F. Willmar
 Branton, B. J. Willmar
 Bratrud, A. F. Minneapolis
 Bratrud, C. Edward. Warren
 Bratrud, Theodor Warren
 Bray, C. W. Biwabik
 Bray, E. R. St. Paul
 Bregel, Fred L. St. James
 Briggs, F. W. Duluth
 Brigham, C. F. St. Cloud
 Brigham, Frank Watkins
 Brimhall, J. B. St. Paul
 Broberg, J. A. Blue Earth
 Broders, A. C. Rochester
 Brodie, Walter D. St. Paul
 Broker, W. S. Battle Lake
 Brooks, Chas. N. Minneapolis
 Brooks, D. F. St. Paul
 Brooks, G. F. St. Paul
 Brown, A. E. Stillwater
 Brown, A. H. Pipestone
 Brown, Edgar D. Minneapolis
 Brown, Ed. I. St. Paul
 Brown, Edw. J. Minneapolis
 Brown, G. E. Rochester
 Brown, John C. St. Paul
 Brown, Lyle L. Crookston
 Brown, P. W. Rochester
 Brown, R. S. Minneapolis
 Browning, W. E. Caledonia
 Brunet, L. M. River Rouge, Mich.
 Buck, Fred H. Shakopee
 Bueerman, Winifred Henry. Rochester
 Buie, L. A. Rochester
 Bulkley, Kenneth Minneapolis
 Bullen, F. W. Hibbing
 Bumpus, H. C. Rochester
 Burch, F. E. St. Paul
 Burden, Verne G. Rochester
 Burfiend, G. H. St. Paul
 Burnap, W. L. Fergus Falls
 Burns, Arthur Rochester
 Burns, F. W. St. Paul
 Burns, H. D. Albert Lea
 Burns, H. J. Duluth
 Burns, M. A. Milan
 Burns, R. L. Two Harbors
 Burns, R. M. St. Paul
 Buscher, H. St. Paul
 Bushey, M. E. Arlington
 Butler, John Minneapolis
 Button, A. J. Hackensack
 Butturff, C. R. Freeborn
 Butz, J. A. Monterey
 Byrnes, W. J. Minneapolis
 Cabot, V. S. Minneapolis
 Caine, A. T. Anoka

Caine, C. E. Morris
Caldwell, Kenneth S. St. Paul
Caley, G. R. Princeton
Calhoun, F. W. Albert Lea
Callahan, F. E. Pokegama
Cameron, J. A. St. Paul
Camp, W. E. Minneapolis
Campbell, D. R. Bagley
Campbell, J. E. South St. Paul
Campbell, L. M. Minneapolis
Campbell, Robert Minneapolis
Cannon, Harry St. Paul
Cantwell, W. F.

International Falls

Carey, Jas. B. Minneapolis
Carlaw, C. M. Minneapolis
Carman, Paul I. St. Paul
Carman, Russell Daniel.

Rochester

Carroll, Wm. C. St. Paul
Carstens, C. F. Hibbing
Carter, Fred G. St. Paul
Cathcart, E. P. Rochester
Catlin, John J. Buffalo
Catlin, T. J. Buffalo
Cavanaugh, J. O. St. Paul
Chadbourne, A. G. Heron Lake
Chamberlin, W. A. Waseca
Chambers, Stanley Owen.

Rochester

Chambers, W. C. Blue Earth
Chandler, O. B. St. Paul
Chapman, T. L. Duluth
Chatterton, C. C. St. Paul
Cheleen, S. J. Minneapolis
Cheney, E. L. Duluth
Christenson, C. R. Starbuck
Christensen, E. P. Two Harbors
Christiansen, A. St. Paul
Christianson, H. W. Wykoff
Christie, G. R. Long Prairie
Christie, R. L. Long Prairie
Christison, J. T. St. Paul
Cirkler, A. A. Minneapolis
Clair, J. B. Winsted
Clark, Chester H. Gallup, N. M.
Clark, F. F. Duluth
Clark, H. B. St. Cloud
Clark, H. S. Minneapolis
Clark, Lenna E. Gallup, N. M.
Clark, T. C. Minneapolis
Clay, E. M. Renville
Clay, F. H. St. Charles
Claydon, L. E. Red Wing
Clement, J. E. Lester Prairie
Clifford, F. O. West Concord
Clifton, Theo. A. Chatfield
Cobb, Donnell B. Rochester
Cobb, S. G. St. Paul
Cobb, Willis F. Lyle
Cochrane, W. J. Lake City
Colby, Woodard St. Paul
Cole, H. B. Redwood Falls
Cole, Wallace H. St. Paul
Coleman, F. B. Austin
Collie, H. G. St. Paul
Collins, A. N. Duluth
Collins, Harry R. Rochester
Collins, H. C. Duluth
Collins, J. S. Wabasha
Colvin, A. R. St. Paul
Comfort, Mandred Whitset.

Rochester

Comstock, A. E. St. Paul
Condit, W. H. Minneapolis
Conley, Alva A. Cannon Falls
Conner, H. M. Rochester
Conner, Wm. H. St. Paul
Connor, C. E. St. Paul
Constans, Geo. Maurice.

Rochester

Cook, Henry Wireman.
Minneapolis
Cook, Paul B. St. Paul
Cooney, H. C. Princeton
Cooper, M. D. Winnebago City
Corbett, J. Frank. Minneapolis
Corrigan, J. E. Spooner
Cory, W. M. Waterville
Cosgriff, J. A. Mankato
Cosgrove, J. H. Duluth
Cosman, E. O. Minneapolis
Counsellor, Virgil S. Rochester
Countryman, Roger S. St. Paul
Covell, W. W. St. Peter
Coventry, W. A. Duluth
Cowern, E. W. North St. Paul
Cowing, P. G. Evansville
Crafts, Leo M. Minneapolis
Craig, C. C. International Falls
Craig, Wm. McK. Rochester

Crandall, A. M. Madison
Crandall, William Graceville
Crane, Wm. Whitfield, Jr.

Rochester

Cranmer, Richard R. Minneapolis
Cremer, M. H. Red Wing
Cremer, Peter Hubert. Hastings
Crenshaw, J. L. Rochester
Cress, E. E. Boyd
Cress, P. J. Ellsworth
Crewe, J. E. Rochester
Critchfield, L. R. St. Paul
Cross, J. G. Minneapolis
Crow, E. R. Minneapolis
Crowe, J. H. Virginia
Crowl, Verne C. Bertha
Crume, Geo. P. Minneapolis
Culligan, J. M. Rochester
Culligan, Geo. Courtney.

Rochester

Curtin, John F. Minneapolis
Cutts, G. A. C. Litchfield
Cutts, George Minneapolis
Cyr, A. Barnesville
Dack, Lloyd G. St. Paul
Dahl, Elmer O. Minneapolis
Dahl, G. A. Mankato
Dahl, John A. Minneapolis
Dahlin, I. T. Coleraine
Dahlstrom, A. W. Minneapolis
Daignault, Oscar Benson
Dailey, W. J. Blooming Prairie
Daly, Joseph Rochester
Daniel, Donald H. Minneapolis
Daniels, H. A. Eveleth
Daniels, J. W. St. Peter
Daniels, W. H. Crookston
Danielson, K. A. Litchfield
Darling, J. B. St. Paul
Darrow, D. C. Moorhead
Dart, Leslie O. Minneapolis
Daugherty, E. B. St. Paul
Daugherty, L. E. St. Paul
Davis, Austin Clifford. Rochester
Davis, B. F. Duluth
Davis, F. U. Faribault
Davis, Herbert St. Paul
Davis, H. S. Duluth
Davis, Lloyd Thomas. Wadena
Davis, Thayer Clinton. Wadena
Davis, William St. Paul
Davison, P. C. Willmar
DeBoer, Hermann Edgerton
Dedolph, Karl St. Paul
Delamere, Granville Sinclair.

Rochester

Delmore, J. L. Roseau
Delude, S. Dassel
Dempsey, D. P. Kellogg
Denman, A. V. Mankato
Derauf, B. I. Brainerd
Desjardins, Arthur U. Rochester
Dezell, Earl R. Minneapolis
Deziel, G. Minneapolis
Dickson, Thos. H. Jr. St. Paul
Diehl, Harold S. Minneapolis
Diessner, H. D. Minneapolis
Disen, C. F. Minneapolis
Ditmeier, L. M. Gerber. Jasper
Dittman, Geo. C. St. Paul
Dixon, Claude F. Rochester
Dixon, Robert Kenneth. Rochester
Dobson, Herbert Victor. Rochester
Doctor, William R. Minneapolis
Dodge, F. A. Le Sueur
Dohm, A. J. St. Paul
Dolan, C. P. Worthington
Dolder, F. C. Eyota
Doms, H. C. Slayton
Doms, Wm. Woodstock
Donaldson, C. A. Minneapolis
Donohue, P. F. St. Paul
Doolittle, L. E. Duluth
Dorge, Richard I. Minneapolis
Dornblaser, H. Bright.

Minneapolis

Douglass, J. E. State Sanatorium
Dowswell, W. J. Benson
Doxey, G. L. Minneapolis
Doyle, George C. Duluth
Doyle, J. B. Rochester
Drake, Carl B. St. Paul
Drake, C. R. Minneapolis
Drake, F. A. Lanesboro
Dredge, H. P. Sandstone
Drenning, F. C. Duluth
Driesbach, N. Minneapolis
Drips, D. G. Rochester
Drought, W. W. Fergus Falls
Dryden, F. M. Crookston
Dubbe, F. H. New Ulm

DuBois, J. A. Sauk Center
DuBois, J. F. Sauk Center
Dudley, J. H. Windom
Dumas, Alexander G. Minneapolis
Dunlap, H. F. Rochester
Dunlap, Alex. Crookston
Dunn, Geo. Robt. Minneapolis
Dunn, Halbert Louis. Rochester
Dunn, J. N. St. Paul
Dunn, Louis Minneapolis
Dunne, Gerald P. Isle
Dunsmoor, F. A. Minneapolis
Dutton, C. E. Minneapolis
Earl, George A. St. Paul
Earl, Robert O. St. Paul
Eberlin, E. A. Glenwood
Ebert, Joseph William. Rochester
Eby, C. B. Spring Valley
Ecklund, E. C. Hibbing
Eckman, P. F. Duluth
Eckstein, A. W. Comfrey
Edlund, G. St. Paul
Edwards, Ralph T. Elysian
Egilsrud, Kristian. Minneapolis
Ehrenberg, C. J. Minneapolis
Eisengraeber, G. A.

Los Angeles, Calif.

Eisenman, W. G. Chisholm
Eisler, Edwin R. Minneapolis
Eitel, G. G. Minneapolis
Ekblad, J. W. Duluth
Eklund, C. T. Duluth
Eklund, W. J. Duluth
Elias, F. J. Duluth
Ellison, David E. Minneapolis
Ellison, Frank E. Monticello
Else, J. R. Glenwood
Ely, O. S. South St. Paul
Empie, W. M. Virginia
Engberg, E. J. St. Paul
Engh, Sigfred Cottonwood
Eppard, R. M. Cloquet
Erb, F. A. Minneapolis
Ericson, J. A. Minneapolis
Ericson, Swan Le Sueur
Ernest, G. C. St. Paul
Ertel, E. Q. Ellendale
Esheby, E. C. St. Paul
Espenlaub, George Henry.

Rochester

Esser, John Perham
Estrem, C. O. Fergus Falls
Eusterman, G. B. Rochester
Evarts, Arrah B. Rochester
Everlof, J. L. Minneapolis
Evert, J. A. St. Paul
Ewens, H. B. Virginia
Ewing, C. F. Wheaton
Fahey, E. W. St. Paul
Fansler, W. A. Minneapolis
Farr, R. E. Minneapolis
Farrist, R. C. Sherburn
Faust, Louis Sanders. Rochester
Fawcett, C. E. Stewartville
Feidt, W. W. Minneapolis
Ferguson, J. C. St. Paul
Ferreira, G. J. Aurora
Fesler, Harold H. St. Paul
Field, Merton Northfield
Figl, F. A. Rochester
Fiksdal, M. J. Willmar
Finney, W. P. Rochester
Fischer, G. Minneapolis
Fischer, H. P. Shakopee
Fischer, O. F. Houston
Fischer, P. M. Shakopee
Fisher, J. M. St. Peter
Fitzgerald, E. T. Morris
Fjeldstad, C. Alfred. Minneapolis
Fjellman, R. C. Minneapolis
Flagstad, A. E. St. Paul
Flinn, B. P. Redwood Falls
Flinn, F. E. Redwood Falls
Fleming, J. Cloquet
Fleischhauer, D. S. Wabasha
Fleming, A. S. Minneapolis
Fleming, C. Filmore. Minneapolis
Fleming, James Cloquet
Fleming, T. N. St. Cloud
Floeken, Chas. F. Minneapolis
Flom, A. O. Chisago City
Flower, Paul George. Rochester
Flotow, W. Z. Minneapolis
Fogarty, Chas. W. St. Paul
Foley, F. E. B. St. Paul
Folken, F. G. Albert Lea
Forbes, R. S. Duluth
Ford, Burton C. Marshall
Ford, Frances A. Rochester
Forrest, C. G. Clearbrook
Forsberg, Carl William. Rochester

Fowler, L. H. Minneapolis
 Fox, John M. Minneapolis
 Franchere, F. W. Lake Crystal
 Franzen, H. G. Minneapolis
 Freeborn, J. A. Fergus Falls
 Freed, C. F. Rochester
 Freed, O. J. R. Cokato
 Freeman, C. D. St. Paul
 Freeman, G. E. Willmar
 Freeman, J. P. Glenville
 Freeman, W. L. St. Cloud
 Freligh, E. O. B. Stillwater
 French, E. A. Plainview
 French, H. S. New London
 Friesleben, Wm. Sauk Rapids
 Frisch, F. P. Richmond
 Fritzsche, Albert New Ulm
 Fritzsche, L. A. New Ulm
 Froelich, H. W. Thief River Falls
 Frost, E. H. Willmar
 Fuerste, Frederick Proctor
 Fugina, George R. Madison Lake
 Fulton, J. F. St. Paul
 Furber, W. W. Cottage Grove
 Gaarde, F. W. Rochester
 Gager, E. C. St. Paul
 Gaines, E. C. Buffalo Lake
 Gallagher, B. J. Waseca
 Gamble, J. W. Albert Lea
 Gamble, R. M. Albert Lea
 Gammell, J. H. Minneapolis
 Gardiner, D. G. St. Paul
 Gardner, Edwin L. Minneapolis
 Gardner, R. D. Eveleth
 Garlock, A. V. Bemidji
 Garlock, Dewitt Howard. Bemidji
 Garwin, John Day. Rochester
 Gates, C. E. Anoka
 Gausemel, S. D. Goodhue
 Gauthier, W. L. Virginia
 Geer, Everett K. St. Paul
 Geissenger, John D. St. Paul
 Geist, Emil S. Minneapolis
 Geist, George A. St. Paul
 Gelz, J. J. St. Cloud
 Gendron, J. F. Grand Rapids
 Gerber, Milo P. Brainerd
 Geromo, Chas. Balaton
 Ghent, C. Harry. St. Paul
 Ghent, M. M. St. Paul
 Ghostley, Mary C. International Falls
 Gibbon, L. L. Lowry
 Gibson, A. J. Duluth
 Giere, E. O. St. Paul
 Geissler, Paul W. Minneapolis
 Giffin, H. Z. Rochester
 Gilbert, J. D. Carlton
 Gilles, F. L. Minneapolis
 Gillespie, M. G. Duluth
 Gillespie, N. H. Duluth
 Gilfillan, J. S. St. Paul
 Ginsberg, Wm. St. Paul
 Gipner, John Frederick. Rochester
 Giroux, A. A. Duluth
 Goeckerman, W. H. Rochester
 Goehrs, H. W. St. Cloud
 Golden, C. M. Tyler
 Goltz, E. V. St. Paul
 Goodheart, C. J. Akeley
 Goodman, C. E. Virginia
 Goodson, Catherine M. Retreat, Pa.
 Gordon, Geo. J. Minneapolis
 Gosin, D. F. Minneapolis
 Goss, Harold Minneapolis
 Gosslee, G. L. Moorhead
 Gough, W. H. Granada
 Graham, David Duluth
 Graham, R. D. Duluth
 Graham, Robert Duluth
 Granger, C. T. Rochester
 Grant, H. W. St. Paul
 Gratzek, Thos. St. Paul
 Grave, Floyd Minneapolis
 Grawn, F. A. Duluth
 Gray, F. D. Marshall
 Greeley, L. Q. Duluth
 Green, E. K. Minneapolis
 Greene, Carl Hartley. Rochester
 Greene, Charles L. St. Paul
 Greene, Earle Ira. Rochester
 Griffin, P. J. Gary
 Grimes, H. B. Madelia
 Grise, W. B. Austin
 Grob, Otto Rochester
 Groll, S. Minneapolis
 Grover, F. E. Duluth
 Gruenhagen, Arnold P. St. Paul
 Gulde, W. C. St. Cloud

Gullixson, A. Albert Lea
 Gunderson, Harley J. Minneapolis
 Gunderson, Nels A. Minneapolis
 Gunderson, R. M. Lake Park
 Gunz, A. N. Center City
 Gutsell, R. S. Zumbro Falls
 Guyer, L. G. Nopemeng
 Habein, Harold C. Rochester
 Haberman, E. Osakis
 Hacking, Frank H. Minneapolis
 Haessley, S. B. Faribault
 Hagaman, Geo. K. St. Paul
 Hagen, G. L. Minneapolis
 Hagen, H. O. New Richland
 Hagen, O. E. Butterfield
 Hagen, O. J. Moorhead
 Haggard, G. D. Minneapolis
 Haight, G. G. Audubon
 Haines, J. H. Stillwater
 Haines, S. F. Rochester
 Halenbeck, P. L. Crosby
 Hall, A. R. St. Paul
 Hall, E. L. Princeton
 Hall, J. M. Minneapolis
 Hall, P. M. State Sanatorium
 Hallberg, C. A. Rochester
 Hallenbeck, D. F. Rochester
 Halloran, Walter Jackson
 Halper, Philip St. Paul
 Hamel, Arnold L. Minneapolis
 Hamel, C. E. Minneapolis
 Hamilton, A. S. Minneapolis
 Hamlin, George B. Minneapolis
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 Hammes, E. M. St. Paul
 Hammond, A. J. Minneapolis
 Hammond, J. F. St. Paul
 Hand, W. R. Elbow Lake
 Haney, C. L. Duluth
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 Hansen, Erling Minneapolis
 Hansen, Olga S. Minneapolis
 Hanson, A. M. Faribault
 Hanson, H. J. Minneapolis
 Hanson, W. Arthur. Minneapolis
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 Harrington, C. D. Minneapolis
 Harrington, Ethel R. Rochester
 Harrington, F. E. Minneapolis
 Harris, C. N. Nashwauk
 Harrison, E. E. West Concord
 Harshbarger, Isaac Long. Rochester
 Hart, A. B. Owatonna
 Hartman, H. R. Rochester
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 Haskell, A. D. Alexandria
 Haskins, John L. Northfield
 Hassett, Roger G. Bird Island
 Hatch, W. E. Duluth
 Haugen, G. T. Fergus Falls
 Hauser, Emil D. Wm. Rochester
 Hauser, V. P. St. Paul
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 Hawkins, V. J. St. Paul
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 Head, G. D. Minneapolis
 Healy, R. T. Pierz
 Hearn, Wm. O. Minneapolis
 Heath, A. C. St. Paul
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 Hegge, O. H. Austin
 Heim, Russell R. Minneapolis
 Heimark, J. H. Moorhead
 Heimark, O. E. Duluth
 Heise, W. F. C. Winona
 Helk, H. H. Minneapolis
 Helland, G. M. Spring Grove
 Helland, J. W. Spring Grove
 Helmholz, H. F. Rochester
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 Hemstead, Werner St. Cloud
 Hench, Philip S. Rochester
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 Henderson, Earl Fletcher. Rochester
 Henderson, M. S. Rochester
 Hendricks, Wm. A. Rochester
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 Henriksen, H. G. Elko
 Henry, C. E. Minneapolis
 Henry, Myron O. Minneapolis
 Hensel, C. N. St. Paul
 Heuslin, A. E. LeRoy
 Herbst, Wm. P. Minneapolis
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 Hermann, Edgar T. St. Paul
 Hertel, G. E. Austin
 Hesselgrave, S. S. St. Paul
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 Hielscher, Julian A. Mankato
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 Hilger, D. D. St. Paul
 Hilger, J. M. Iona
 Hilger, L. A. St. Paul
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 Hoffman, Max H. St. Paul
 Hoildale, A. D. Tracy
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 Holst, J. B. Little Falls
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 Horwitz, Alec Rochester
 Houck, Knut Hoegh. Rochester
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 Hunt, H. E. St. Paul
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 Hunt, V. C. Rochester
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Kelly, Paul H.	St. Paul	Lee, W. P.	Northfield	McKeon, Owen	St. Paul
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Kerlan, S. Z.	Aitkin	Leonard, L. J.	Minneapolis	McMurtry, Walter C.	Virginia
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Kesting, Herman	St. Paul	Lepak, John A.	St. Paul	McPheeters, H. O.	Minneapolis
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Killins, Wendell A.	Rochester	Liedloff, A. G.	Mankato	Magie, W. H.	Duluth
Kimball, H. H.	Minneapolis	Lillie, H. I.	Rochester	Magney, F. H.	Duluth
King, E. A.	Minneapolis	Lillie, W. I.	Rochester	Mahle, A. E.	Rochester
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Kistler, C. M.	Minneapolis	Linton, W. B.	Rochester	Marley, W. J.	Minneapolis
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Kittelson, T. N.	Fergus Falls	List, Walter E.	Minneapolis	Mark, D. B.	Minneapolis
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Klein, Harry	Duluth	Litzenberg, J. C.	Minneapolis	Martin, T. R.	Duluth
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 Mayo, W. J. Rochester
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 Meckstroth, C. W. Brandon
 Mee, F. H. Osseo
 Meierding, Wm. A. Springheld
 Mellicke, W. A. Nicollet
 Meland, O. N. Warren
 Melby, Benedict. Blooming Prairie
 Mellby, O. F. Thief River Falls
 Nelson, Oliver C. Rochester
 Melzer, G. R. Lyle
 Mentzer, Stanley H. . . . Rochester
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 Merkert, G. L. Minneapolis
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 Merriman, L. L. Duluth
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 Meyer, P. S. Belle Plaine
 Meyerding, E. A. St. Paul
 Meyerding, H. W. Rochester
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 Miller, V. I. Mankato
 Miller, W. A. New York Mills
 Miller, Walter H. Buhl
 Mills, J. L. Winnebago City
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 Miners, G. A. Deer River
 Mingo, F. E. Hugo
 Mitchell, A. B. Hector
 Mitchell, Frederick St. Paul
 Mitchell, R. S. Grand Meadow
 Moersch, F. P. Rochester
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 Moorhead, M. B. Minneapolis
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 Morley, G. A. Crookston
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 Morrison, A. W. Minneapolis
 Morrissey, F. B. St. Paul
 Morrow, James J. Austin
 Morse, Harry Dodge. . . . Rochester
 Morse, John Minneapolis
 Morse, M. P. Le Roy
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 Morsman, L. W. Hibbing
 Morss, C. R. Zumbrota
 Mortenson, N. G. St. Paul
 Morton, Chas. Bruce. . . . Rochester
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 Moses, Joseph, Jr. Northfield
 Moss, Myer N. St. Paul
 Mayer, Ralph E. Bemidji
 Moynihan, A. F. Sauk Center
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 Muhme, Norman Benedict. . . .

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 Neal, J. M. Minneapolis
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 Nelson, M. S. Granite Falls
 Nelson, Nesmuth Brainerd

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 O'Connor, J. P. St. Paul
 O'Connor, J. V. St. Paul
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 Offutt, Susan R. Rochester
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 Ohage, Justus, Jr. St. Paul
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 Omohundro, Miles Parker. . . .

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 Palmer, W. L. Albert Lea
 Paradine, J. Duluth
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 Parker, Stephen Thomas. . . .

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 Perry, Ralph St. John. . . .

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 Preine, I. A. Minneapolis
 Prickman, Louis Elwood. . . .

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MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association
Northern Minnesota Medical Association and Minneapolis Surgical Society*

VOL. VIII

JUNE, 1925

No. 6

TWILIGHT ZONES OF PATHOLOGY AND CLINICAL MEDICINE*

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Duluth

This is to be neither a general comment on clinical medicine nor an outline of any segment of pathology. Rather is it to point out a few representative fields where these two great agencies of medical precision are either groping independently or failing to work co-ordinately. Various obstacles interpose themselves—the nomenclatures used are too inflexible; precedent and custom keep the pathologist too far away from the patient; the clinician too far away from the operation, the laboratories, or the autopsy room. Just as the student is taught medicine segmentally, so he practises it. Where proven pathological sequences go hand in hand with demonstrable clinical entities, there we find our greatest satisfaction. But, there are still many fields where one must spend far too much time in search for this harmony. Too often we see our hard earned clinical ground taken away from us by a pathological offensive—far too didactic and backed up more by the awe that surrounds any dictum coming “out of a laboratory,” than by any actual proven set of facts.

Though it is estimated that from 60 to 75 per cent of all those who consult us have functional complaints, for which (supposedly) there may be no pathological foundation, and though the field for psychotherapy and analysis is enormous, still it is just about as inky a mess for us today as was the whole field of medicine before Virchow and men of his type. If the whole souled (not to say whole time) pathologist has some faults, they are chiefly those of our own contribution. Certainly the Islamite is worse than lost without his Mohammed; no matter how wretchedly he subscribes to his faith, he at least must know which direction

is East; and even in the very highest expression of his zeal does he not usually place his idols in the poorest lighted portions of his temple? This, in a word, is an appeal, gentlemen, to a society that has always respected and taught pathology, to bring our pathologists out from under stairways and inaccessible recesses into our councils as well as our confidence, and to ask in all humility that they also shall meet us with the same brotherly frankness. Let us all begin to master the same language.

HOSPITAL RECORDS AND AUTOPSY NOTES

One hundred and sixty autopsy records at St. Mary's Hospital, Duluth, accumulated over a period of about twenty months, have been analyzed. The clinical diagnoses have been contrasted with the anatomical findings. As you will know, these clinical records were put down by at least fifty different doctors; the pathological-anatomical notes were made chiefly by one well trained pathologist.*

At once the thought arises, how much antagonism and divergence was found? Surely enough, but that is not the prime purpose of the segmental analyses I shall make. In fact, the pitting of the clinician against the pathologist is exactly what we should desire to get away from. The wise anatomist begins his autopsy exactly where the clinician leaves off—where the latter is willing to state, “These are my findings to the best of my judgment, and these are the clinical leads—follow them up.”

Why did the patient die? This is no more difficult to answer at times than the question, “How did he live?” As far as the necropsist is concerned, the answer to the latter is final—at least when he finishes his work the subject is dead. However, the route by which he traveled thereto is often far from definite if clinical sequences are not measured up and evaluated in addition to the

*Read before the Minnesota Academy of Medicine, St. Paul, Minn., Feb. 11, 1925.

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pathological ensemble that made up the situation at the finish.

Specialism, while fruitful in providing intense application along limited lines, is also likely to be wasteful in minimizing the importance of proportion. The specialist in pathology must be kept familiar with clinical entities, sequences and developments in medicine and surgery.

A discussion in brief of certain groups of conditions where the clinical and pathological viewpoints frequently clash is submitted. This only too clearly indicates the need for more close and harmonious investigation.

ENCEPHALITIS

Mrs. M. Z., aged 39, female, No. 96690. Admitted to the hospital Feb. 18, 1924; died March 3, 1924. *Clinical diagnosis*.—Epidemic encephalitis, Parkinsonian syndrome. *Anatomical diagnosis*.—Brown atrophy of the myocardium and of the liver. Symphysis of the pericardium. Old and extensive pleural adhesions. Chronic congestion of the lungs. Beginning pneumonia, especially of right lower lobe. Acute purulent bronchitis. Status after extirpation of the tubes, the left ovary and subtotal hysterectomy. Small cystic degeneration of the right ovary. Struma diffusa colloides sub-sternalis.

Comment.—The brain in this case showed no gross change; therefore, it is not mentioned in the anatomical findings any more (and rightly) than is the spleen. The microscopical data might be considered a little more determinate since, "moderate perivascular infiltration" was found, but to a very limited degree, etc.

The anatomical findings here do not certainly give any inkling as to this most serious disorder, overwhelming a previously well patient, and producing such characteristic expression, changes in temperament and disturbance in mental and psychic makeup, as to render the patient totally helpless.

Attention is drawn to this not to find fault with the limitations of the pathologist, but to point out that either our methods of study of brain tissue are inadequate, or extraordinary functional changes can take place in the brain without gross tissue perversion. Do we know, even how often perivascular infiltration, with certain types of cells, occurs in a considerable variety of clinical disorders or conditions, or even in health?

DIABETES

Two contrasting cases are submittted. One is a typical atherosclerotic woman of 64, who in the list of autopsy findings did show some "atrophy of the pancreas." However, there was a long list of anatomical findings, including thrombosis of the abdominal aorta, widespread atherosclerotic changes, with coronary sclerosis, arteriosclerotic kidneys, etc. Might not this patient have easily gone on to autopsy, in which the pathologist would have known nothing of the decisive clinical course she had run, and easily have missed the import of a clinical state that is far from dubious, either in the mind of the patient or her physician?

A man, aged 59, came to autopsy, who had been treated elsewhere as a diabetic for about eighteen months. He had an old history of abdominal discomfort and attacks that were undoubtedly from his gallbladder. He died of the late sequelæ thereof, including multiple abscesses in the liver; yet, there was nothing, either grossly or microscopically, found in his pancreas, to indicate abnormality. Why did he have diabetes, and why did he appear to prosper under the usual dietary regime, and for a considerable period with the use of insulin? The pathologist answers as follows: Somewhere in the literature he has found reference to the fact that inflammatory disturbance about the lymphatics in the pancreatic, gall duct, and adjacent areas, prevents the Langerhans hormone from getting via the lymphatics into the circulation. It is known that 10 per cent to 20 per cent of diabetics have their diabetes incidental to chronic inflammatory disease in this area and are very greatly benefited when this pathology is eliminated. It must be obvious, in any case, that since insulin given orally is ineffective, any hypothesis indicating that the natural hormone is absorbed via the gastrointestinal tract is likewise untenable.

AUTOPSIES ON SYPHILITICS

Reference is made to a series of autopsies in known syphilitics. Where definite visceral lesions, such as aortitis, aneurysm, or definite cerebrospinal changes were present, the clinical and anatomical findings closely approximated each other.

On the other hand, where the clinical findings were indefinite, and only positive blood serum data were available upon which a basis of syphilis had been made, it was notorious that the clinician had overlooked a lot of other situations, chiefly tied up with chronic vascular degeneration and its

inevitable influence upon important organs, such as the heart, the kidneys and the lungs.

An instance of optic atrophy occurred, in which it was supposed to be due to cerebrospinal syphilis. At autopsy, however, a large aneurysm of the left internal carotid, with compression of the optic chiasm, was found.

In an instance in which, in an elderly man with positive serological findings in the spinal fluid, the bradycardia was supposedly due to a large cerebral hemorrhage, the pathologist was able to show only very slight terminal hemorrhages in the meninges, but also found these rather extensively through the other organs, and also rather decisively in the bundle of His.

SENILE CHANGES

There are lessons to be learned through familiarity with the sequence of events, as well as pathological changes, that occur in those advancing into the sixth and seventh decades of life with diffuse arterial degeneration. In the cases studied, the prostate had been grossly neglected fairly often. Where outspoken pathology had been obvious in such organs as the heart, the clinician seemed to be satisfied to accept what he found, and looked no further. Perhaps, as to these late degenerative lesions, this made no vital difference either with treatment or prognosis. On the other hand, it draws to our attention the necessity of fully evaluating the devastating load that may be visited upon already incapacitated kidneys by the changes arising from urinary retention. Every man over fifty, particularly if he shows tendency to atherosclerosis, should have his prostate kept under surveillance.

In this group fall the late carcinomas of the stomach. It is easy to see, in reviewing a series of these, that late vascular degeneration of the same type as mentioned above, has an extraordinary and vital influence upon operability, post-operative comeback, and surgical complications, and, as in surgery in general, some of the very keenest problems presented to the internist are those associated with a correct estimate of cardiac capacity in the presence of the obvious changes known to be correlated with, and back of, the various grades of fibrosis. Little experience is needed to impress the great difficulties involved in giving a *prognosis*, not only in angina pectoris but in the many other less dramatic syndromes in which regional discomfort as well as pathologic infer-

ence demands at least an approximation of cardiac capacity. Here is a big and vital field where pathologists and clinicians "do not think in each other's language," even though they attempt a common tongue.

SOME PITFALLS IN CLINICAL PATHOLOGY

The pathologist has never maintained that his province is within the confines of the dead-house. Unfortunately, and all too often, when he has been led therefrom into the more benign effulgence of clinical experience, he becomes a clinician, and often is classed among our best internists. However, if the dark places in our professional work are to be lighted up, it is vastly to everyone's advantage that arrangements be made whereby the pathologist may still hold to his original field, cultivate adeptness, as well as familiarity with this province, and continue in it. What we should aim to do is to give him the aid in knowing of and understanding clinical concepts and sequences, in something of the same degree that we so eagerly urge him to unburden upon us his findings, his hypotheses and prognostications.

It can easily be shown that pathologists are constantly being called upon to make differentiations at a *set time* or stage of development in a disease process, where such a differentiation is quite impossible. How can he know that, unless he abandons the conviction (instilled into many by their early training) that the microscope is only an amplification of inspection, and that it need not err as to what is actually present, but it may obviously and frequently err when it is made all too encompassing, and the interpreter reads into it the rest of the cross-word puzzle, because he knows a few of the letters involved!

GOITER CLASSIFICATION AS AN EXAMPLE

The Mayo Clinic classification as given by Boothby (1922) may be contrasted with the classification of Charles A. Elliott, Northwestern University, Chicago.*

Mayo Clinic—1922

- (1) Colloid adolescent goiter
- (2) Adenomatous goiter—non-toxic
- (3) Toxic adenoma
- (4) Exophthalmic goiter
- (5) Thyroiditis (including tuberculosis)
- (6) Carcinoma of thyroid
- (7) Secondary hypothyroidism
- (8) Myxedema

*Given at the clinical session of the Interstate Assembly, Milwaukee, Wis., Oct. 31, 1924.

Chas. A. Elliott—Chicago

- (1) Physiologic hypertrophy
- (2) Endemic goiter
- (3) Non-toxic goiter
 - (a) Persistent physiological
 - (b) Colloid
 - (c) Fetal adenoma
 - (d) Cysts
 - (e) Neoplasm
- (4) Toxic goiter (any of the above that are overactive)
- (5) Exophthalmic goiter

Tribute should be paid to the great advantage that has accrued from an attempt at goiter classification. No logical attacks on the goiter problem, either as to diagnosis, therapy or prognosis, nor any enlightened education of the public, can be carried on without some such means of dividing goiter up into its groups. However, are we at all sure that the *pathology* underlying these different cases is much more than an approximation? The closest students of goiter problems are those who would probably admit that none of such classifications will endure for very long. They represent at the most the best current opinion of the time in which they are made. Discrepancies occur between the histologic pathology shown in goiters removed, and that usually discussed in the literature as being either the accompaniment or the cause of toxicity.

It might be stated briefly that controversy (if we admit that it does exist) centers chiefly about Classification No. 4 in Elliott's grouping, and whether "exophthalmic goiter" is a clinical syndrome of unknown or at least undetermined ultimate etiology, or a syndrome based upon more or less definite and constant tissue change within the thyroid itself. In any case, this is not so much an appeal or demand for an absolute etiology, which (in the present state of our knowledge) is not to be expected, but rather to focus our attention upon goiter classifications, and maintain that while the clinician and the pathologist have tried to function as co-ordinately in this field as any common situation with which most of us are forced to deal, nevertheless, "the exceptions in pathology noted" are becoming too frequent to be ignored. Many surgeons are removing goiters for toxicity that show no evidence of adenoma in any stage, and in which the most extensive search, with

numerous sections, fails to show convincing evidence either of hyperplasia, round-cell massing or infiltration, or any of the other so-called Basedow imprints.

Careful students of goiter are coming to doubt whether there is the definite distinction in type and quality of the toxicity incidental to perverted secretion from adenoma in the thyroid, or from the rest of the gland, as in Graves' disease. Lahey* appears to feel, as does Biedl, that it is a question of degree and intensity of toxins rather than any essential structural difference.

Attention may be drawn to the types of operative reactions seen in exophthalmic goiters where the diagnosis could not be well questioned.

(a) A young girl of nineteen had this type ingrafted upon an adolescent colloid goiter of seven years' duration. Lugol's solution may have benefited the patient constitutionally, but it did not change the pulse rate notably. Rest in bed, tonsillectomy, et cetera, brought down the basal metabolism from nearly 100 to 36 plus. Despite definite exophthalmos, one searched in this gland in many areas, but without success, to find anything except the ordinary overfilling of colloid. Here and there there was some round cell infiltration. She bordered some on the neuro-circulatory-asthenia type, and the post-operative pulse reaction was very startling. Even so, there was not the raging overheating or the leaky, sweaty skin. She reacted very well, but one can predict that she will recover her general balance rather slowly.

(b) In contrast, a patient ten years older, with goiter formation and evident toxicity occurring synchronously, is very much benefited by the exhibition of Lugol's, and has a very slight post-operative reaction. Her gland shows on tissue section exquisite hyperplasia and papillary indentations of the follicles, etc. She has not been sick long, and will do well after operation.

(c) Then, an individual of about the same age and the same type of goiter, and treated in exactly the same manner, with a preliminary ligation to give additional security, has an explosive post-operative reaction, accompanied with a leaking of the pores of the skin—almost unbelievable—with associated pulmonary, tracheal and laryngeal edema, that rapidly proved fatal.

The histology of the thyroid tissue does not as yet explain these clinical differences.

*Surgical Clinics of North America, Vol. IV, No. 6.

OUR PROBLEMS IN LYMPH GLAND AND HEMATOLOGICAL DISORDERS

CASE 1: An instance of a female, aged 48, who died of the complete picture of pernicious anemia.

She had an associated splenomegaly for the last two and one-half months of her life. It is very striking to note that this patient had sufficient anemia to make her very uncomfortable for fully fourteen years. This is an uncommonly long time, and makes us loath to ever exclude pernicious anemia simply on a basis of the length of time involved. Suffice it to say that she did not have syphilis, Banti's disease, tuberculosis, or intestinal parasites. Slowly and insidiously the full clinical picture developed, and the course of the disease ultimately established the diagnosis.

CASE 2: A male, aged 35, seen first June 17, 1919. An enlargement of the glands of the neck was diagnosed by us as Hodgkin's disease. This diagnosis was changed after a biopsy had been made at another clinic August 29, 1919. A letter from their pathologist states, "To me this is the typical histological picture of lymphosarcoma. Personally, I am of the opinion that lymphosarcoma and Hodgkin's disease are the same condition, the latter being the fibrous stage of the former, etc." Naturally, the man had plenty of roentgen treatment. By March, 1922, attendants at the Michael Reese in Chicago reported that the man had lymphatic leukemia, with a leucocyte count of 31,000. By June, 1924, he had come to the well known authority on Hodgkin's disease, Dr. J. L. Yates, of Milwaukee. A letter from him indicated this opinion: "According to our estimate, this man has never had lymphosarcoma, but was suffering from an aleukemic leukemia type of Hodgkin's disease." Suffice it to say that he died with the leukocyte count ever mounting higher.

Our records show, as does the literature, that this changing about and intermixture of entities involving lymph glands that are supposed to be definite and fixed is by no means rare. It should, for one thing, teach the pathologist, in making biopsies on lymph glands, to watch his step; to the hematologist these instances should cause him to safeguard his reputation by limiting the domain of his opinion. It should teach us all to study the clinical course of all disease through its entire period.

CASE 3. A girl, aged 11, sick about one year. For the obvious enlarged cervical glands (bilateral) she had the usual tonsillectomy and adenoidectomy. The glands were soon after somewhat reduced in size. Thereafter, roentgen and quartz-lamp therapy was tried, with considerable benefit. Finally, eight months after the beginning of her trouble, a surgeon removed the glands from both sides of the neck. Thereafter the pathologists, where this tissue was removed, were evidently in doubt—some thought that the glands were tuberculous; some did not think so.

When seen recently, the clinical course has most certainly been that of Hodgkin's disease, with beginning secondary anemia, pressure pain—involving the ears and the Eustachian tubes—but as yet, the patient has no other obvi-

ous lymph gland involvement. This improvement under various forms of treatment is characteristic of Hodgkin's disease. With tuberculous glands of the neck becoming something of a rarity, clinicians and pathologists should both be cautious in diagnosing tuberculous cervical adenitis.

CASE 4. A woman, aged 52, presented herself with a pathological fracture of the left humerus. Roentgen studies soon showed multiple bone tumors. One of these, curetted out, was pronounced by the pathologist, "sarcoma"—but he did it with a reservation!

This patient ultimately came to autopsy, and was a definite instance of multiple myeloma.

<i>Lympho-Sarcoma</i>	<i>Chloroma</i>	<i>Myeloma</i>	<i>Leukemia</i>	<i>Hodgkins</i>	
+	2+	3+	+	+	<i>Bone Tumor Formation</i>
2+	0 (+)	0 (+)	+	+	<i>Visceral Tumor Formation</i>
2+	0 +	0	2+	2+	<i>Lymph Gland Enlargement</i>
(+)	0 +	0	+	+	<i>Mic. Picture of Glands</i>
0 (+)	+	+	0 (+)	0 (+)	<i>Mic. Picture of Bone Tumors</i>
(+)	3+	2+	+	+	<i>Gross Character of Bone Tumors</i>
0	+	0	+	0	<i>General Blood Picture</i>
0	+	0	0	0	<i>Exophthalmos</i>
<i>Any Age</i>	<i>Young-Under 25</i>	<i>Over 40</i>	<i>Middle Life</i>	<i>Majority are young</i>	<i>Age Incidence</i>
<i>Acute & Fatal</i>	<i>Chronic Prog. Fatal</i>	<i>Chronic Prog. Fatal</i>	<i>Chronic Prog. Fatal</i>	<i>Chronic Prog. Fatal</i>	<i>Progress & Course</i>
<i>May or may not improve</i>	<i>Not improved</i>	<i>Not improved</i>	<i>Improved by Treatment</i>	<i>Improved by Treatment</i>	<i>X-Ray Features</i>

Glosely Related Disease Entities

(Microscope alone usually indeterminate)

J.R. Kuth

We are indebted to Dr. J. R. Kuth for making a rather intensive study of the literature from the standpoint of the conditions associated with primary or secondary bone tumors. A copy of his chart is here presented, and will quite explain itself. In a few words, it teaches the fallacy of attempting differentiation based solely upon tissue microscopy or the elements seen in blood smears. Naturally, these different so-called "disease entities" are related. We may say that all febrile diseases have points of similarity, but that doesn't mean that we are unable to verify the various types even where etiology is unknown. Accordingly, this chart shows the necessity of correlating all the evidence, and here again the pathologist will continue to muddle along with the misunderstanding and mystery surrounding what is meant by sarcoma, until the most intensive correlated clinical and pathological studies are made.*

*See reference on next page.

Finally, reference may be made to Phemister's classification of malignant bone tumors. It is obvious that both the microscope and the roentgen film simply enlarge and extend our faculties and facilities for inspection. In this fact, the manner of bone resorption or deposition, its characteristic alignment and the evidence of osteogenetic tissue in the metastases—pulmonary and otherwise—furnish data that is possibly more convincing even than any biopsy could provide with the aid of the microscope.

These illustrations might be multiplied almost indefinitely. In characteristic cases a very large niche in the lesser curvature of the stomach indicates a carcinomatous ulcer. A microscopic section through the entire wall of this ulcer could tell you no more. Therefore the roentgenologist is also a pathologist—none of us can evade the issue.

This general review is given, as mentioned in the beginning, to in no way belittle the efforts or work of pathologists. Neither is it to suggest that each and every specialist and practitioner should be "his own pathologist." Rather is it to safeguard, direct and unify our combined efforts, not only for the benefit of each and every current patient, but for the further elaboration and perfection of medical science as a whole. Ways and means must be devised to keep good progressive, alert and intensive men in pathology. Disease must be studied throughout its entire course. It would appear that we have within a harmonizing of clinical and pathological efforts an excellent field, promising much that is instructive, as well as applicable, in the working out of our daily problems.

*We need only refer here to the splendid work that is being done by the standardizing committee which is presently said to be about ready to report on this very vital matter, and has already passed out to different teaching institutions a preliminary differentiation more logically based than any we have had up to date.

THE PHLORHIZIN TEST IN THE DIAGNOSIS OF PREGNANCY

The test is made by injecting 0.002 gm. of phlorhizin into the gluteal muscles of the patient, who has been fasting. The patient drinks 200 c.c. of water. Immediate test of the urine for sugar serves as a control. Six specimens of urine are examined, at fifteen-minute intervals, for glycosuria. If glycosuria is provoked, the test is reported as positive; otherwise, negative. Reports on the reliability of the test are conflicting. (*Jour. A. M. A., Apr. 25, 1925, p. 1292.*)

OBSERVATIONS CONCERNING OBESITY WITH REPORT OF CASES OF ENDOGENOUS TYPE*

C. A. MCKINLAY, M.D.
Minneapolis

According to Tileston,¹ obesity may be considered to be present when the body weight is 15 per cent or more above the average for the given height and age. The maintenance of constant body weight is, indeed, a remarkable physiological fact when it is considered that slight continued variation in food intake or exercise may profoundly affect it. In an instance of maintenance of the body weight for twenty years, noted by DuBois,² the total food intake corresponds to the expenditure of energy with an error of only .05 of 1 per cent. DuBois also gives the instance of a man whose gain in weight of 75 kilos in twenty years, expressed in terms of energy intake and expenditure, showed that he had eaten only 11 grams or one small butter ball too much, or walked at a slow rate one and one-third miles too little, daily. With this exogenous type of obesity due to disproportion between food intake and energy output we are not especially concerned in this paper, but rather with endogenous obesity.

This latter term has been defined as obesity due, not simply to overnutrition or underexertion, but to the involvement of one or more endocrine glands. We should not assume, however, that a sharp line can be drawn between all cases because clinical observations indicate a blending of types. Lyons³ stresses this blending in his study of clinical groups of fatty deposit including Dercum's disease, simple obesity, Frölich's syndrome and other types of lipomatosis. He insists that they are all essentially identical and are only variations of a common morbid process. Lyons considers that the pathological findings and the general evidence suggest the view that the process is due to alteration in the glands of internal secretion. Faber⁴ mentions that caloric intake must be adjusted in cases of the endogenous, as well as of the exogenous type. He suggests that superfluous calories throw an added task on the organs which regulate the oxidative processes of the body. If they are

*From the Department of Medicine, University of Minnesota. Read before the Hennepin County Medical Society, Minneapolis, February 2, 1925.

unequal to this task, the superfluous nourishment is deposited as fat. The metabolic anomaly in this endogenous obesity may not affect the basal metabolism, but thyroid treatment may stimulate the organs involved and lead to throwing off of the fat deposits. Dubois⁵ suggests as a possibility that simple obesity may be the only manifestation of an endocrine dysfunction which in more marked cases shows demonstrable physical stigmata of pituitary or other disease.

No more valuable study on obesity has appeared recently than that of Grafe⁶ on the constitutional or endogenous type. Grafe is inclined to believe that the endocrine factor is chiefly the thyroid gland, since he and Eckstein found that the luxury consumption of energy accompanying overfeeding depends upon the presence of this gland. They found in animal experimentation that when the thyroid gland was removed there was not the increase in metabolism after food intake which is normally present. The absence of obesity following castration or in eunuchoidism he thought to be due to compensatory hyperfunction of the thyroid. The thyroid influence in this type of endogenous obesity may not be indicated by any alteration of the basal metabolism, since it is considered by Grafe to be within normal limits in a majority of cases when modern surface area formulas are used. This is in keeping with Means'⁷ observations that a majority of obese patients show no alteration in the basal metabolism, but that a slight reduction may be found in subjects with frank evidence of endocrine disease. Grafe lays great importance upon the reduced specific dynamic reaction found in obesity. Plaut⁸ found in the obese abnormally small increase of metabolism after food intake. In contrast, she found a very marked rise of metabolism in the opposite type of persons, those with constitutional thinness, whose weight remains low no matter how much they eat.

Wang and Strouse⁹ have recently reported the results of their study on twelve obese subjects and found that they showed a lowered specific dynamic reaction after food intake, particularly protein, and they noted an opposite effect in thin individuals. These observers found that neither excessive underweight nor overweight is associated with a constant change in the basal metabolism.

The endogenous type of obesity, however wide may be its inclusion of other types, may, accord-

ing to Barker,¹⁰ be divided into the three main groups of hypothyroidism, hypopituitarism and hypogenitalism. To these may be added the obesity found with tumors of the pineal and adrenal glands, also adiposis-dolorosa. Two cases classified as endogenous obesity are reported in this paper in some detail. Justification for the report of the first case may be found in what has been considered a conclusive demonstration of a change in thyroid function from hyperactivity to normal or retarded activity with onset of obesity.

CASE REPORT

Case 1. Mrs. T. L., aged 33, came under observation May 15, 1923, complaining of palpitation and nervousness. The present illness began six years previously in 1917, and was characterized by weakness, palpitation, distention of abdomen, and loss of weight. Nervousness consisted of a sense of suffocation, tremors, and excitability caused chiefly by the presence of crowds or by some unusual circumstance, rather than by any physical exertion. Loss of weight amounted to about 30 pounds. The appetite remained good. After three months the patient began to gain weight with subsidence of symptoms. About two years later a similar attack occurred with another period of loss of weight extending over a period of a few months. Since then the patient has not been symptom-free except for short intervals of one to two months. Six weeks before observation there was increased weakness and aggravation of nervous symptoms.

Throughout the periods of complaint the patient has had a remarkably good appetite. From statements obtained from the patient and her husband of the amount of carbohydrate food eaten, the estimated daily food intake has been about 4000 calories. This fact has been of diagnostic value. The family history was unimportant. The past history by systems showed nothing important except that eleven years previously the patient suffered from an illness with symptoms similar to those described above, including weight loss and with recovery in four to five months. Dysmenorrhea has always been present with scanty flow and irregularity. Patient has been married seven years and has never been pregnant.

Physical examination showed a well developed and well nourished woman, weighing 130 pounds. The skin and hair were normal. Examination of chest and abdomen was negative. The heart rate was not accelerated. There was no exophthalmos or lid lag, and the pupils were active and equal. The isthmus of the thyroid was slightly enlarged. No thrill or bruit was present. Slight tremor of the hands was noted. The patient was mentally alert but was neither emotional nor excitable during the examination. The laboratory data added nothing of importance except that the basal metabolism was persistently above normal, varying from plus 20 to plus 38, averaging plus 28. A diagnosis of exophthalmic goiter was made. During the next three months the patient received three x-ray exposures over the thyroid gland. Following this she had a remission of symptoms, entire absence of palpitation and

a return of her metabolism to normal. Her menstruation also became normal. Except for a period of two or three weeks in November, 1923, the patient had relief from symptoms for a period of sixteen months. When seen in December, 1924, the patient showed a weight gain of 40 pounds but no signs of myxedema. The skin was normal and there were no fat pads above the clavicles.

In spite of the increased weight, there was the remarkable drop in food intake from an estimate of 4000 calories to one of 2500 daily, certainly no more. At the same time the basal metabolism was normal, reading plus 1 per cent.

The history of this patient might indicate a functional neurosis and that alone. Palpitation, breathlessness not caused by exercise, and a sense of suffocation when in a crowd, all might point that way. Back of an equivocal history, however, as far as nervous and mental reactions are concerned, stand out certain other facts of primary importance. First, a history of good health until 18 years of age.

may be fairly considered to be characteristic of the altered metabolism of thyroid disease.

We have considered that there is evidence of periods of disturbed thyroid function extending over several years; that the first phases were those of hyperactivity followed by retardation not amounting to myxedema. We have also interpreted as possible evidence of glandular interrelationship the alteration in menstrual function with decreased thyroid activity. Aside from demonstrated changes in the basal metabolism of this patient there has been the marked evidence of nutritional change as illustrated by the caloric intake and weight chart. As the patient has been entirely comfortable, no treatment of obesity has been attempted.

A graphic representation of the thyroid function

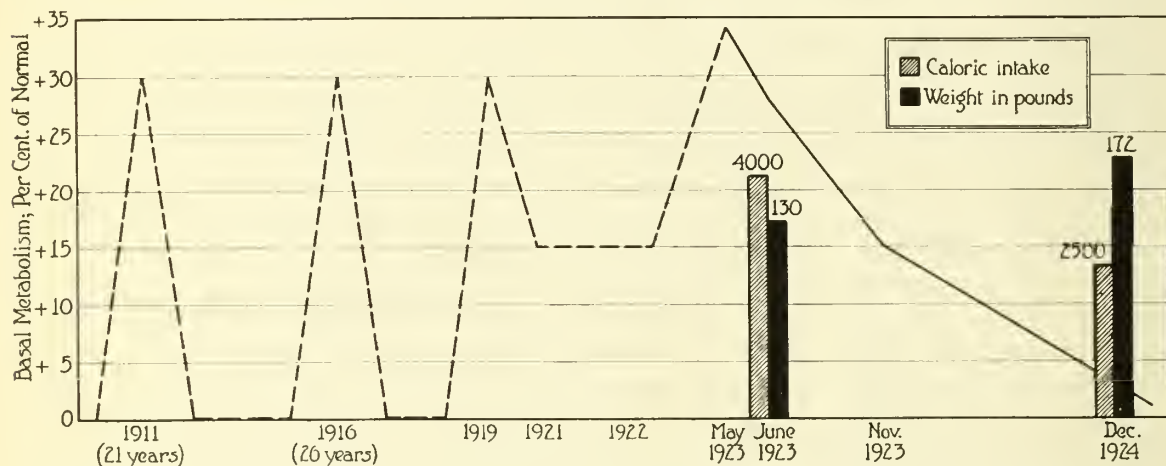


Fig. 1. Dotted line: Diagram to represent periods of hyperthyroidism reconstructed from history alone. Solid line: Basal metabolism under observation. Change of relation of food intake to weight is shown with alteration of thyroid function. Case 1.

Second, absence of evidence of infection. Third, increased basal metabolism. Fourth, association of symptoms of exhaustion, palpitation, excitability, and irritability, with weight loss and increased appetite and food intake. Fifth, period of gain of weight amounting to slight obesity after retardation of thyroid function following irradiation. Sixth, remarkable alleviation of dysmenorrhea following the above mentioned alteration in thyroid function. Seventh, gain of weight with lessened food intake. Eighth, remittent character of illness. One remission we have observed following x-ray treatment with a fall of the basal metabolism to normal. Very significantly this gain in weight has occurred with the presence of decreased food intake, which

is here presented which up to the first time of observation is entirely diagrammatic and has been reconstructed from history alone, interpreted in the light of the data later obtained through observation of the patient.

Case 2. E. B., white, female, single, aged 18. The patient entered the University Hospital August 3, 1921, complaining of obesity. Photographs indicated that obesity started at about the age of three years. The gain in weight had been continuous. Though inconvenienced in getting about and troubled with slight shortness of breath, the patient had felt well. Her appetite was normal and, according to her statement, she ate no more than other members of her family. Her greatest weight had been 346 pounds. The menstrual history was normal. The past history was unimportant. The family history revealed two aunts with obesity.

Examination showed a very obese girl weighing 318 pounds. This distribution of fatty tissue was fairly uniform although it appeared to be relatively greater through the shoulder and pelvic girdles. The fat was neither nodular nor painful. Skeletal growth appeared normal. There was no unusual distribution of hair or pigmentation of the skin. The viscera were normal. The eye grounds were normal. The laboratory data, which were all normal, included urinalysis, blood count, sugar tolerance, blood sugar, urea, and creatinin, and negative Wassermann. The basal metabolism varied from -12 to -20 per cent. By x-ray, the sella turcica appeared large though within normal limits. The patient was placed on a 1200 calorie diet and given anterior pituitary substance (3 grains daily). Weight loss in 30 days amounted to 15 pounds.

The patient came under observation again in November, 1923, showing slight increase in weight. At this time she was given 800 calorie diet and thyroid extract (grs. 2, twice daily). In ten weeks her weight dropped from 326 pounds to 263. The basal metabolism remained normal and showed no marked change.

The features of this case that attract our attention are: first, the marked obesity which showed partial response to reduction of diet, proper exercise, and the use of anterior pituitary substance; second, the signs of anatomic changes in the sella turcica which might indicate pituitary disease, but which are inconclusive because of no supporting clinical evidence; and third, slight reduction of the basal metabolism below the limits of normal.

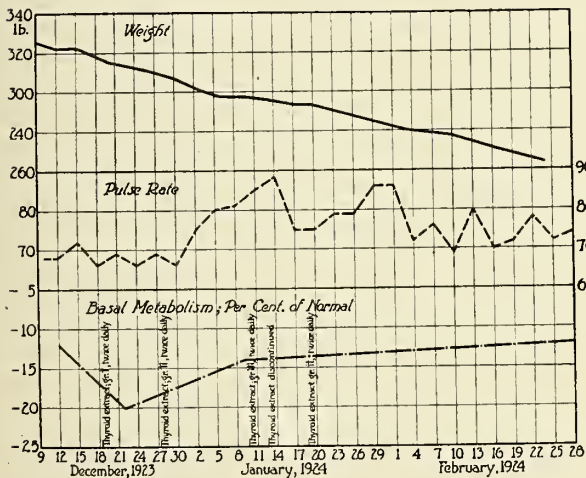


Fig. 2. Showing the pulse rate, basal metabolism, and loss of weight in pounds following the reduction of diet and the administration of thyroid extract. Case 2.

Considering the onset of obesity in early childhood, endogenous, possibly hypophyseal, origin has been suggested. It is known that obesity of that origin may be accompanied by a reduction in

the heat production of the body. Such reduction may possibly be due to accompanying thyroid changes not uncommonly found in pituitary insufficiency. Cushing¹¹ found thyroid changes in all of fifteen such cases of pituitary insufficiency.

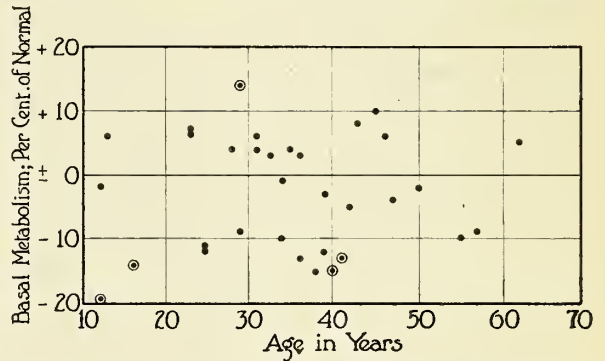


Fig. 3. Showing the basal metabolism of a series of 33 obese subjects. Dot in circle indicates endogenous type. All others were classified as simple obesity.

Sufficient indication for the use of thyroid extract was thought to exist. Two to four grains were given daily. The loss of sixty-three pounds attests the effectiveness of the treatment. The patient was more comfortable and developed no nervous or cardiac symptoms. The pulse rate showed no marked change, usually being below eighty. The patient has been observed since and weight has remained about 265 pounds. It should be kept in mind that this response was obtained by the combination of lowered food intake with thyroid extract.

A graphic representation of the basal metabolism of thirty-three obese subjects is shown in Figure 3. The series illustrates the increased frequency in females, there being only three males in the series. No extended analysis of this series is attempted. Mention is made of the information gained from the histories that the patients often dated the onset of obesity following pregnancy and in fewer instances following menopause. It is seen that obesity was associated with normal basal metabolism in over two-thirds of the cases and that, of nine patients with subnormal metabolism, four had some physical signs suggestive of endocrine dysfunction.

The obese patient that is alert and active and has a basal metabolism normal or at the upper limits of normal may be distinctly harmed by thyroid extract, the unfavorable reaction being indicated by onset of palpitation, tachycardia, and

nervousness. Loss of weight does not always result to the extent desired. If goiter is present, harm may be done by stimulating its activity. Indiscriminate use by the laity of weight reduction preparations is one source of such unfavorable reaction.

Any case of obesity which does not show a reduction of weight on a low calorie intake gives presumptive evidence of an endogenous factor. Although one or more endocrine glands may be involved, clinical evidence points strongly to dysfunction of the thyroid gland as the important factor. While other glandular preparations have been used, thyroid extract has given the best result.

Indications for thyroid therapy in obesity may be considered to be present in two groups of cases. First, with evidence of hypothyroidism, hypopituitarism, or hypogenitalism, thyroid extract in addition to a corrective diet may quite constantly be expected to aid in weight reduction. Secondly, when frank evidence of endocrine disease is lacking, the disproportion between body weight and caloric intake and exercise suggests a lowered level of energy exchange in the body. This level of energy exchange may be increased by the addition of thyroid extract. Proper control of the patient includes observations for unusual nervous, cardiovascular, and digestive symptoms, and also determination of the basal metabolism. Too rapid weight loss should be avoided. As the water balance is not infrequently abnormal in endogenous obesity, accumulation of water in the tissues without edema may account in certain instances for the maintenance of body weight in the presence of lowered caloric intake. According to Grafe, thyroidectomized animals rapidly gain weight, due largely to retention of water. Loss of weight following thyroid extract may be due in large part to loss of water from the tissues. It may be sug-

gested that more attention be paid by clinicians to water intake in obesity.

CONCLUSIONS

1. One case of endogenous obesity due to alteration of thyroid function is reported that illustrates a phase of the cyclic variation of thyroid function occasionally observed. Another case of endogenous obesity with lowered basal metabolism is reported which lost weight after the use of a low calorie diet and thyroid extract.

2. In the obese, lack of weight loss after lowered food intake and sufficient exercise suggests a rational basis, under proper control, which includes estimation of the heat production of the body, for the addition of the use of thyroid extract.

3. In a series of thirty-three cases of obesity, twenty-eight classified as simple and five as pituitary in origin; the basal metabolism was normal in twenty-three cases, above 10 per cent in nine, and below in nine. Signs of endocrine disease were found in four of the nine patients with subnormal basal metabolism.

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THE ALIMENTARY IMPLANTATION OF LACTO-BACILLUS ACIDOPHILUS

Those who have followed the successive changes of view regarding the dietotherapeutic rôle of lactic acid-producing micro-organisms since the pioneer writings of Metchnikoff on this subject, must have wondered how any feature of it can have retained scientific stability. Claim after claim has been hastily set up, only to be abandoned after a short period. Yet the practical use of the types of bacteria here concerned somehow persists in one form or another with a pertinacity that challenges some attention. Recent in-

vestigations seem to indicate that the Bulgarian bacillus cannot be implanted in the human intestines. For this reason, doubt has been cast on any alleged physiologic action of this organism in the intestine.

Preference has latterly been given to *Lactobacillus* (*Bacillus*) *acidophilus*, based on claims of superior possibilities of alimentary implantation. Recent investigations give evidence that *Lactobacillus bulgaricus* differs from *Lactobacillus acidophilus* in the ability of the latter to live in the intestinal tract. (*Jour. A. M. A.*, Apr. 25, 1925, p. 1277.)

BLADDER DIVERTICULA: REPORT OF TWO CASES*

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Perhaps the most concise as well as complete definition of a vesical diverticulum is that of Kelly and Burnam, who describe it as a "congenital pocket, locus or sac of variable size, communicating with the cavity proper of the bladder, attached to its periphery, and lying below or at one side of, posterior to, or above the bladder." The opening between the diverticulum and the bladder varies from a wide mouth to a narrow sinus.

Englisch has attempted to classify these out-pouchings into two groups: (1) Those in which the wall of the diverticulum is comprised of mucosa and a true musculature; (2) those whose walls consist entirely of mucosa.

In a general way the diverticula of the first group are congenital, whereas those of the second group are acquired. According to Voelcker some cases which result from perforation of perivesical abscesses into the bladder are classified as diverticula, and such false diverticula, as he terms them, are necessarily not lined by mucous membrane.

According to Judd and Scholl, bladder diverticula are probably due to embryologic defects in the bladder, either a weakening of the musculature or a definite hiatus in the wall of the bladder. Perhaps the simplest explanation is that of Kelly, which holds that diverticula are usually formed from small pre-existing pouches or herniae in the bladder which become enlarged by pressure and later make themselves known through stagnation of urine, stone or neoplasm formation, or by pressure symptoms on a ureter.

Hodgson in 1857 recognized that a common cause of diverticula was to be found in a prostatic or a urethral obstruction, giving us at this early date a practical explanation for the fact that diverticula in women are uncommon. At the Mayo Clinic a five months' embryo was observed to have definite diverticula in the region of each ureteral orifice. Lennander has reported a case in an infant, age twenty-one months, in whom the exciting cause was urethral obstruction due to phimosis. The German school believed that one

could determine whether or not a diverticulum was congenital or acquired by an examination of the diverticular wall. The congenital type was supposed to contain all the layers of the bladder wall, whereas the acquired had a wall consisting only of fibrous tissue covered with epithelium. This classification and differentiation does not work out practically, since pathological conditions within the sac may entirely destroy the epithelial lining and even the musculature.

Crosbie states that his microscopic examination of the walls showed sometimes pavement epithelium, usually fibrous tissue with only scattered smooth muscle fibers, and in no place could muscle bundles be seen. He feels certain that all diverticula are congenital and that they are discovered when they produce symptoms of obstruction or infection, or both. The puckered opening into the diverticulum is so distinct and so different from the appearance of a trabeculated bladder that it does not seem possible that one of these small pouches can enlarge and become a true diverticulum.

Symptoms resulting from the presence of diverticula depend upon their size, location, and multiplicity. There are undoubtedly many diverticula which produce no symptoms; this has been demonstrated frequently by postmortem examination of patients dying of other conditions. Individuals with symptoms suffer much discomfort, and the diverticulum may become not only a menace to health, but also to life. The subjective symptoms are often obscure and many cases have nothing more than pain and difficulty in urination. Sometimes the patient may urinate and after emptying the bladder is obliged to urinate again after a short time. A symptom which has been described is the passage of clear urine without pus followed immediately by a considerable amount of urine containing a great amount of pus, the latter being urine from the diverticulum. This sign is, however, unusual in my opinion, because practically all of these cases have infected bladders, the urine frequently being putrid and loaded with pus, and also because the diverticulum, being inelastic, cannot empty itself.

The diagnosis of vesical diverticulum is very often made in the course of a cystoscopic examination made for other conditions and it is only since this instrument has come into common use that a large number of cases have been observed

*Read before the Ramsey County Medical Society, St. Paul, March 30, 1925.

and accurately diagnosed. The cystoscopic picture in the typical case is quite characteristic, namely, the presence of a dark spot of lesser or greater size in the wall of the bladder mucosa. The presence of numerous dark spots in the bladder wall would lead one to suspect multiple diverticula. It is easy to mistake a dilated ureteral orifice for a diverticular opening, but this condition can be easily differentiated by cystograms, ureteral catheterization and ureterograms. A practical point during the course of a cystoscopic examination is to insert a ureteral catheter into the dark spot, or, even better, to insert a lead catheter, following this by radiographic examination. I have frequently observed, on withdrawal of the catheter from the diverticulum, a considerable amount of flocculent pus pouring out from the infected sac. The examiner should be very cautious not to misinterpret certain cystoscopic findings in a normal bladder for vesical diverticula. We have seen cases in which there existed traction on the fundus or lateral walls of the bladder due to pelvic inflammatory processes or previous operations which upon cystoscopic examination gave the impression of a diverticulum. The use of the ureteral catheter and of the cystogram established the proper diagnosis at once.

There are certain areas in the bladder where diverticula are most apt to be found. The most common site, as first noted by Pagenstecher, is in the lateral wall in close approximation to the ureteral orifices. As above noted the cystogram is of great importance in making the diagnosis and radiographs should be taken in various positions in order that a better idea of the size and exact location of the diverticulum may be determined.

Dr. W. Lerche published in 1912 an ingenious method for introducing a rubber bag filled with boric solution to determine the size of the diverticulum; he likewise used this bag to distend the diverticulum at the time of operation.

Papilloma, carcinoma, angioma, and concretions have been found in cases reported. Pressure on the ureters may result in hydronephrosis and pyonephrosis. Acute inflammation, gangrene, and even perforation of the diverticular sac have been observed and described.

Just a few words regarding the incidence of diverticula. From 1894 to 1923, 133 cases of diverticula of the bladder were treated surgically at the Mayo Clinic. Ninety of the patients or 67.6

per cent had multiple diverticula, seventeen had two, ten had three, six had four, and in ten the number was not determined.

At the Mayo Clinic from 1907 to 1920, twenty-eight patients or 12.1 per cent had coincident calculus and diverticulum of the bladder. Hinman in twelve of the 205 collected cases found the ureter involved. In 1910 Fischer collected forty-eight cases with twenty-eight cases operated; 8, or 40 per cent, died. In 1922 Kneise and Schulz collected thirty-five cases from the German literature and added eighteen of their own, where radical operation was performed. The mortality was 7.7 per cent. Blum recently published a monograph reporting thirty-two cases in which he had performed a complete extirpation of the sac. He does not, however, give his mortality statistics in this series.

Various methods of treatment have been attempted for the cure of this condition:

1. None at all where the condition provokes no trouble.

2. Palliative treatment by irrigation and sterilization of the bladder in those who are too old, ill, or feeble to withstand any operation.

3. Incision of the orifice leading into the diverticulum, thus making it a part of the bladder.

4. Excision of the mucous lining in the pocket with denudation, suture and closure of the margin of the orifice.

5. Extirpation of the diverticular sac and when necessary transplantation of a ureter, or if the ureter enters near the base of the diverticulum the Young flap operation.

Various types of operation have been devised, but the most successful and safest is the complete extra-peritoneal excision of the sac of the diverticulum. The transperitoneal route carries with it too much danger of peritonitis. The sacral route has been attempted for the diverticula in the posterior wall of the bladder, but it is difficult to secure adequate exposure by this method. As in all other surgical conditions, the operative procedure depends greatly upon the condition of the patient, and, as Kelley so well puts it, something of that imponderable factor called "vitality" must be known. The exact condition of the urethra, bladder, ureters, and both kidneys must be determined if possible. In the presence of a stricture or hypertrophied prostate, it may become necessary to remove the lower obstruction and to drain the blad-

der as a preliminary step. In fact it is sometimes wise in the presence of a severely infected bladder to drain it suprapubically as a preliminary step. In cases where the patient's condition is poor, where it is extremely difficult to free the diverticulum, one may remove as much of the fundus as possible and insert a drain in the diverticulum outside the bladder. Then, working inside the bladder, the edges are denuded and sutured. In this way drainage of the diverticulum is obtained and there is a possibility of obliterating it entirely.

Lower-Calot technique: an incision is made from the pubes to the umbilicus down to the bladder, which has been previously filled with a solution. The bladder is then mobilized, especially laterally. Then the bladder is opened and the openings of the diverticulum made out and explored. Ureteral catheters are then passed and left in during the operation. The diverticulum is packed with gauze and is freed outside of the bladder by blunt dissection usually with the fingers. To free the last tissue about the neck of the diverticulum, it is best to remove the gauze and evert as much as possible of the diverticulum into the bladder and then work with the fingers outside the bladder and the thumb inside of the bladder at the outlet of the diverticulum, grasping the wall of the diverticulum between the thumb and forefingers. In this way the adhesions are freed. When the diverticulum is entirely freed, it is excised at the neck and the cut edges brought together with chromic catgut sutures. The bladder is closed with a suprapubic tube left in and a rubber drain placed outside the bladder to the site of the diverticulum.

CASE 1.—Mr. J. H. Age 45. July 15, 1924.

Present Complaint.—Bleeding from urethra, pain over bladder, frequency, burning on urination, dribbling, bloody urine.

Present Illness.—First began to bleed from urethra about two years ago. This came on very suddenly with pain in the bladder region. No pain in the back or down the legs. Second hemorrhage followed about eleven months after the first. Present hemorrhage (third) began July 14, 1924, and he was admitted to the hospital at once.

Past Illness.—Varicose veins of right leg removed two years ago. Has been under the care of a physician for two years or more and during this time was being treated for a chronic cystitis by catheterization and bladder irrigation. Never well during this time but seemed to improve a little now and then with frequent setbacks, accompanied by increased frequency, dribbling, and burning urination with urine usually cloudy.

Examination.—Patient was seen in hospital in consultation with Dr. Max Hoffman. Urine: acid, sp. gr., 1023; albumin, 4 plus; r.b.c., 4 plus; leucocytes, plus; pus, plus; sugar, negative. Blood: hemoglobin, 78 per cent; r.b.c., 3,840,000; coagulation time, five minutes. Temperature and pulse normal. B.P., 112/90. Patient was found to be in considerable pain, restless, anemic in appearance, and skin very clammy. X-ray of the bladder advised. X-ray of bladder revealed two large walnut-sized stones, and about twenty-five smaller ones, apparently in the prostate area. Because of considerable amount of bleeding, cystoscopic examination was not thought advisable.

Operation.—Suprapubic cystotomy. The bladder was first irrigated with boric acid, but no attempt was made to wash out the many clots present. The bladder was distended with boric acid solution and incision made in mid-line. The bladder wall obtained and anchored with linen sutures held by forceps. Upon entering, the bladder was found to contain numerous blood clots, all of recent origin. Two large stones were found free in the bladder. The x-ray revealed other stones, but they were not found in the bladder proper. Upon further exploration, with assistant's finger in the rectum, we found a sac or pocket to the right lateral side of the prostate. The assistant was able to feel other stones with the finger in the rectum. An incision was made broadening the opening found in the bladder to the diverticulum and the stones removed. On account of the poor condition of the patient and the location of the diverticulum it was thought not advisable to attempt to remove the sac. The neck of the sac was cauterized with hot irons, the finger in the rectum acting as a guide. A suprapubic drain was placed in the bladder and the bladder walls were sewed with chromic No. 9 and three silk worms, equistone being used for skin. Uneventful recovery followed until August 7, 1924, when the patient developed a thrombosis of some varicose veins of the left leg. They were removed at a later operation.

Progress.—Patient gained rapidly and has been feeling well ever since.

CASE 2.—Mr. H. N. Age 75. April, 1923.

Present Complaint.—Considerable trouble in passing urine for the past two years, frequency of urination, and all signs of retention.

Present Illness.—He had had repeated bladder irrigations for cystitis a year previously. Following these irrigations he improved considerably and gained in weight. For about six months he irrigated himself at home twice a week. In March, 1923, he began to have considerable urinary trouble. On August 15, 1923, he was sent to the hospital for examination, complaining of dribbling, frequency, and considerable amount of pain on urination. He had to be catheterized three times a day.

Past history is negative with the exception of a neisserian infection at twenty-one. The patient has never had an adequate stream since he was thirty-five years old.

Physical examination showed a man underweight, anemic, and with clammy skin. Development and nourishment were only fair. He complained of much pain in the lower abdomen and a constant desire to urinate. Head, neck and chest were normal. The patient had two large indirect inguinal herniæ. The hernia on the right side was considerably

larger than that on the left and bulged down into the scrotum. The penis showed an embryological defect, the meatus being on the ventral surface of the glans. Neurological examination failed to show any abnormality. The prostate was small and hard.

Urine examination, acid, 1020; leucocytes and pus, one plus; trace of albumin.

Examination with sounds revealed the presence of a marked stricture just anterior to the prostatic urethra. Soft rubber catheters could not be inserted. For two months sounds were passed until a Fr. 28 could be inserted. The patient was then instructed to irrigate the bladder with boric acid and at various times mercurochrome.

A cystoscopic examination was made on July 10, 1923, at which time a distinct band was observed in the region of the prostate. The patient's symptoms having become more severe, it was decided to perform a suprapubic cystotomy. October 18, 1923, the bladder was opened and a band-like process in the internal meatus was excised. The bladder wall showed much trabeculation, but at this time we did not explore the fundus and lateral walls because of the weakened condition of the patient.

The operative recovery was uneventful and before leaving the hospital the patient felt considerably improved. There was still a retention of about three or four ounces.

I have seen this patient about once a week since the operation, and his condition has remained practically the same.

OPERATIONS IN ABSENTIA

A French surgeon attached to the St. Louis Hospital in Paris has invented a new device whereby medical students in an adjoining lecture-room may observe every detail of an operation without disturbing either the patient or the operator by their actual presence on the scene. An ingenious arrangement of lights and mirrors enables them to follow every movement of the operating surgeon, and for their convenience the whole picture is considerably enlarged. Moreover, a loud speaker carries to them the comments of the operating surgeon upon his work.

The new device, which has been named the episcopes, is the invention of a young French physician, Dr. Thuillant. The St. Louis Hospital possesses the only one at present in use, but a second is being installed at the Ecole Dentaire. —*The Living Age*, Feb. 14, 1925.

Jealousy is not confined to opera-singers; you find it chiefly in soldiers and doctors. I think the only profession exempt from it, that I have encountered,—for what reason I do not know,—is the Bar.

Success affects men and women very differently. I have known a few who were improved by it; some made by it; but most get their heads turned and are ruined by it. I should much like to have experienced it—even for a short time—to know how it would have affected me; but I can affirm with truth that I have never been jealous of it. On the contrary I think life would be a drab place if we all walked the same pace, and I follow with joy every good thing that turns up for my friends.—MARGOT ASQUITH, *London Magazine*, December, 1924.

THE ADMINISTRATION OF NATURAL AND ARTIFICIAL SUNLIGHT IN PRIVATE PRACTICE* **

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Although heliotherapy was employed by physicians of ancient times it was on a purely empirical basis until recent years. Indeed, all the reasons for the excellent results obtained from heliotherapy even yet have not been satisfactorily explained. To my knowledge Rollier¹ was the first to place heliotherapy in the treatment of human disease upon a scientific basis. It was he who carefully regulated and graduated the dosage of the sun's rays for certain disease conditions. Most of his work has been done at high altitudes above the cloud line and for some time it was a question as to whether such excellent results could be obtained at lower altitudes. In America we are deeply indebted to the physicians working at the J. N. Adam Memorial Hospital at Perrysburg near Buffalo, New York, who have proved beyond question that high altitude is not essential to excellent results from heliotherapy. Moreover, light from the quartz mercury vapor lamp and light from an electric arc introduced by Finsen² may be available at all seasons of the year even in lands of little sunshine.

WHAT DO WE REALLY KNOW ABOUT THE ACTION OF SUNLIGHT?

We know that when properly administered sunlight has a beneficial effect upon patients suffering from certain diseases such as tuberculosis and rickets. Just how the benefit to the patient is accomplished was for a long time a subject of conjecture and much speculation. However, rather scientific investigations have provided us with considerable definite information. We know direct sunlight is a powerful bactericidal agent; we know also that rays from the quartz mercury vapor lamp have a bactericidal action. From the standpoint of preventive medicine these facts are of great significance.

Hume³ pointed out that irradiation with the quartz mercury vapor lamp can prolong normal

*Read before the Hennepin County Medical Society, February 25, 1925.

**From the Department of Preventive Medicine and Public Health University of Minnesota and The Lyman-hurst School for Tuberculous Children.

growth in rats on a diet almost free, or free, from vitamin A. She states "that the interplay in growth and rickets is the same, and the very existence of an interplay in both cases heightens the possibility that the two vitamin factors may be identical or nearly allied." Goldblatt and Soames⁴ for the most part confirmed the work of Hume. These authors as well as Hume call attention to the fact that vitamin A may be stored in the animals' tissues. After conducting similar experiments Steenbock and Nelson⁵ came to the conclusion that the continued growth in Hume's animals as well as in their own was due to vitamin A stored in the tissues. Moreover they believe that ultra-violet light cannot substitute for vitamin A, but can substitute for the antirachitic vitamin. With this thought in mind Steenbock and his co-workers^{6,7,8} began experiments to determine whether in the absence of antirachitic vitamin "light may be an important factor entering into the production of normal growth and wellbeing of many of our domestic animals." From their first study, limited to chickens, they state that: "It is apparent from our data that light can play a very important part in the rearing of baby chicks, acting as a supplement or the equivalent to the antirachitic factor of food-stuffs." "From limited data it appears that one-half hour daily exposure to direct sunlight was much more potent in furnishing the antirachitic equivalent than was 5 per cent of a synthetic ration fed as fresh green clover, calculated on the basis of the dry weight of the clover." From their second study, limited to swine, they state that "Gross symptoms supported by chemical analysis of blood and bone as well as by histological evidence indicate that sunlight is a factor of economic importance in the production of pork under confined conditions in northern latitudes."

Hess⁹ has recently shown that by exposing cottonseed oil to the rays from the quartz mercury vapor lamp for one hour the oil becomes endowed with antirachitic properties. He states that cottonseed oil so treated "frequently acquired a somewhat fishy odor resembling that of cod liver oil." "Naturally, one of the first things which suggests itself is the possible association of a phenomenon of this kind with vitamins."

Later after making a thoroughgoing study of this subject Steenbock and Daniels^{9a} summarized the results of their work as follows:

"By exposing such food materials as wheat, rolled oats,

corn, hominy, cream of wheat, shredded wheat biscuits, corn flakes, patent wheat flour, cornstarch, meat, milk and egg yolk to ultraviolet light, they can be endowed with rickets-preventing properties. That such a wide variety of foods can be thus affected appears to be due to the fact that practically all naturally occurring foods contain lipoidal constituents of the nature of sterols which can carry this activation. Cholesterol, for example, as obtained from brain is entirely inactive, but after exposure to ultraviolet light becomes rickets-preventing.

"As fats are good solvents for these lipoids, practically all fresh fats, such as butterfat, olive oil, lard, corn oil, coconut oil and cottonseed oil, can be activated, often to a degree to make them compare favorably with cod liver oil. As antirachitic action consists in the induction of calcium assimilation and its conservation for the animal, this is a matter which concerns not only the young but also the adult.

"It is suggested that these findings may have their significance not only in nutrition, but also in the therapy of those diseases known to respond to irradiation with ultraviolet light."

In 1919, Huldshinsky¹⁰ proved beyond doubt that light is the important factor in the treatment of rickets. In addition to the use of natural sunlight he proceeded to use the quartz mercury vapor lamp with excellent results. Since that time Hess and his co-workers^{11,12,13,14} as well as McCollum and his co-workers^{15,16} have carried on many scientific investigations with experimental and clinical rickets. They have also found that this disease may be prevented as well as cured by exposures to sunlight or to rays from the quartz mercury vapor lamp. It has been found that where the blood calcium is decreased, the use of light rays soon results in a normal blood calcium content. Speaking of inorganic phosphate in the blood of children after careful analyses Hess¹⁷ says, "This seasonal tide of the blood phosphate, the ebb in the winter, and steady rise to the flood of summer time, is to be attributed mainly to the seasonal variation of sunlight." In discussing the importance of light in the treatment of rickets, Hess¹⁷ also says, "The question of etiological importance of light cannot be considered by itself, but must be surveyed in relation to reciprocal factors, of which the most important are diet, rate of growth, and pigmentation of the skin. Experiments on rats demonstrate that if the diet is markedly productive of rickets, long exposures to light are necessary to afford protection, whereas if the diet is less inadequate short exposures suffice. Various gradations of these two factors can be formulated at will. The same is true in relation to growth.

Numerous animal experiments could be cited to illustrate this point. For example: On the standard diet, a standard degree of light-raying of four minutes daily with the carbon arc at a distance of 3 feet will invariably protect against rickets. On this diet rats grow poorly. When it is amplified so as to lead to progressive and moderate growth the same degree of irradiation will fail to protect. This phenomenon, translated into terms of clinical medicine, signifies that the atrophic or marasmic infant—notably unsusceptible to rickets—has, in relation to this disorder, a far smaller requirement of active light rays than the rapidly growing normal infant. Three-quarters of the infants developing clinical rickets in our institution have been thriving well, whereas only one-quarter developed the disease while making small gains. This is one explanation, as can be shown by animal experiment, of the ‘spontaneous cures’ which occur in infants during the second year of life when the growth impulse is less intense. A third factor affecting the potency of light is the intensity of pigmentation of the skin. This aspect likewise can be demonstrated by a simple experiment. If two groups of rats (the melanotic form of the Norway rat) are given the minimal protective dose of light, it will be found that although diet and rate of growth have been the same, the black rats will develop rickets, whereas the white rats will show no rachitic lesions. It is manifest that the protective rays were rendered inert by the pigment of the integument and the fur. This experiment has evident applicability to the well-recognized susceptibility of negro infants to rickets, and may be interpreted as indicating that negro infants require a greater degree of the effective light rays than do white infants.”

The history of the use of light in the treatment of rickets is discussed more fully by Park.¹⁸

In 1902 Bernhard, as pointed out by Rollier,¹ obtained good results by exposing affected extremities of patients to sunlight. In 1903 Rollier¹ began his work in the treatment of tuberculosis by the sun’s rays. Since that time Rollier and many others have proved conclusively that heliotherapy when combined with dietetic and hygienic regimen produces excellent results in tuberculosis of certain parts of the body other than the lungs. The recent experimental work of Mayer and Dworski¹⁹ led them to the following conclusion: “We believe that

our experiments show that the ultra-violet light has definitely influenced the healing of corneal tubercle of rabbits’ eyes.” Until very recently it was believed that heliotherapy is contraindicated in pulmonary tuberculosis. Here again recent investigations have contributed much to our store of knowledge. LoGrasso and Balderrey²⁰ found that patients taking heliotherapy show an increase in hemoglobin, a diminution in the leucocytes and a corresponding increase in the lymphocytes. After applying heliotherapy to patients suffering from pulmonary tuberculosis they said: “Heliotherapy is of greatest value in the treatment of pulmonary tuberculosis, one of the most marked benefits noted being the striking improvement in the general physical condition.” “It lessens the activity of the pulmonary lesion, as indicated by the subsidence of fever, reduction in pulse rate, decrease in moisture, cessation of night sweats, decrease in amount of sputum and greater ease in expectoration.” “According to our experience heliotherapy will not provoke hemoptysis, increase the activity of a lesion, or reactivate it if judiciously employed.” “Moderate elevations of temperature, not due to acute complications, do not preclude its use, but we recognize as contraindications tuberculosis in the very active stage, marked toxemia and the acute miliary form of the disease.”

The value of heliotherapy in certain diseases cannot be questioned. A great many of the good reports have come from hospitals, so many indeed that there has developed the belief among some physicians that heliotherapy cannot be satisfactorily employed except in institutions. It is true that heliotherapy like other special forms of treatment can be more easily administered in hospitals, but it is sufficiently easily administered in the home to make it available for the great mass of patients who cannot or will not go to hospitals. Moreover, hospital capacity in this country is often so limited that patients are long on the waiting list and must be discharged before their recovery is complete. Such patients should have the benefit of heliotherapy when indicated.

HOW CAN HELIOTHERAPY BE ADMINISTERED TO THE PATIENT OUTSIDE THE HOSPITAL?

In certain sections of the United States the sun’s rays may be used the greater part of the year, but in other parts, particularly in the states of the

north, the winter season is too cold and the sunshine too scant to be of much use. During the other seasons of the year it is remarkable how much good may be accomplished by the proper use of sunlight. The sun's rays are just as effective and in some instances more so about a private home than about a hospital. This is especially true when the home is located near the city limits or in the country. A very little trouble on the part of some member of the family will often make it possible for the patient to take heliotherapy although the home is located in a densely populated residence district of a city. For example, one patient gave up sanatorium treatment about the time symptoms suggestive of intestinal tuberculosis were appearing. She had suffered from an extensive pulmonary tuberculosis, but this was largely brought under control by artificial pneumothorax. When she returned to her home she was advised to take sunlight exposures daily. On first thought this seemed to her an impossibility inasmuch as her home was located close to other homes. Her husband, being a carpenter, went to the attic, where he converted a small window into a door on the south side of the house. He then built out from this door a small porch. This was high enough above the surrounding houses so that the patient could lie in the sunshine without being seen by neighbors or people passing on the street. She was kept under medical supervision and although three years have passed and she is still

roof of an old woodshed into a suitable place for his tuberculous wife to take heliotherapy. After being exposed to the sun's rays here through the late spring, summer and early fall months, this patient had a splendid coat of tan and showed much improvement in her general condition.

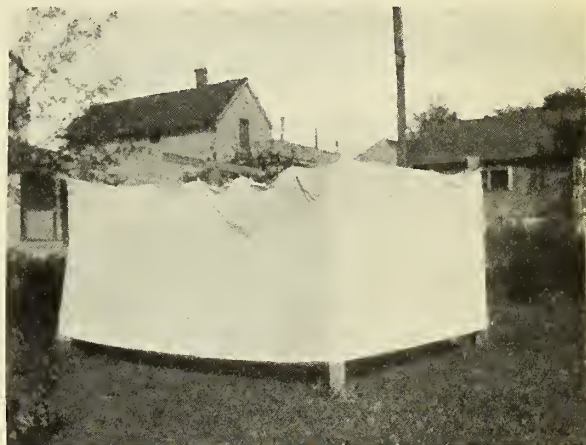


Figure 2A

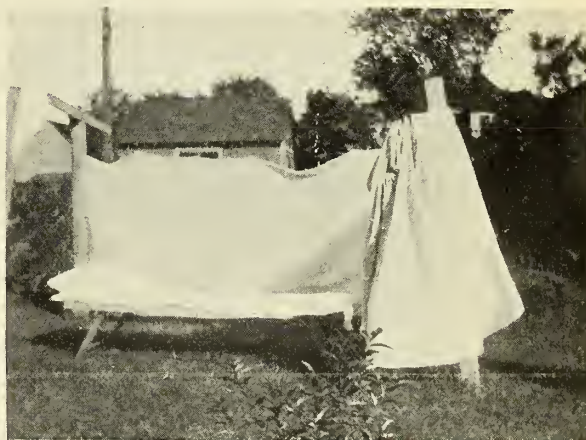


Figure 2B

In Figure 2-A is shown a frame which a young man made in order that his tuberculous sister might take heliotherapy in their back yard. Their home is located in a rather densely populated part of a city. The canvas stretched about the frame makes it possible for the patient to prepare for the exposure and lie on the cot (B) unseen. The canvas is so placed that one or more sides may be lowered (see Figure 2-B) and yet the patient is kept protected from the view of neighbors.

Many other ingenious devices might be cited but suffice it to say that nearly any one, even though living in a city, who is sufficiently desirous of



Figure 1

taking artificial pneumothorax treatment all symptoms referable to tuberculosis in any part of her body have long since disappeared and she has assumed all of her duties in the home.

Figure 1 shows how a husband converted the

taking heliotherapy may do so during certain seasons of the year. I well recall listening to a lecture on heliotherapy less than a decade ago in which the lecturer advocated the building of small glass houses for patients. Evidently he did not know that ordinary window glass filters out most of the rays of therapeutic value. We now know that no glass should be interposed between the source of light and the patient's body.

The technique for administering natural sunlight has been so carefully described recently by Lo-Grasso and Balderrey²⁰ that I cannot do better than quote them.

"First Day: The patient, reclining on a bed, and with eyes protected from the sun by means of colored glasses or towel and the head by a linen cap or bonnet, was taken to the sunporch. The only clothing worn was trunks. Only the feet were exposed and irradiated on this day. They were insolated for periods of five minutes three times during the day with intervals of about one hour.

"Second Day: Each insolation period of the feet was increased to ten minutes, and more of the body was treated by insulating the lower extremity from the knees to the ankles for five minutes.

"Third Day: The feet were irradiated for fifteen minutes at each period. The time of insolation, from the knees to the ankles, was increased five minutes, and still more of the lower extremity treated to insolation by exposing from the hips to the knees for five minutes.

"Fourth Day: The entire lower extremity was now receiving sunlight in the following doses: hips to knees, 10 minutes; knees to ankles, 15 minutes; and feet 20 minutes. The abdomen was now insolated for five minutes.

"Fifth Day: The insolation periods were now: abdomen, 10 minutes; thighs, 15 minutes; legs, 20 minutes; and feet 25 minutes. The last part of the body to receive its initial insolation, the chest, was now exposed for five minutes.

"The periods of insolation were correspondingly increased 5 minutes each day upon each previous subdivision of the body, until on the 12th day the longest exposed part received a total radiation time of three hours, the exposure periods being: for the feet, 60 minutes; knees to ankles, 55 minutes; thighs, 50 minutes; abdomen, 45 minutes; and chest, 40 minutes. From this day to the 16th the insolation period of the feet remained 60 minutes. The remaining subdivisions were increased by 5 minutes each day until each subdivision received 60 minutes irradiation. On the 17th day the insulations were reduced to one morning and one afternoon period of 90 minutes each. The anterior and posterior surfaces received the same amount of radiation, the total exposure being divided equally between the two surfaces.

"All cases were advised to take an air bath during the regular hours, when the sun's energy was not available for radiation. No more than three hours of sun per day, or one and a half hours for a single exposure, was allowed. This was found to be necessary, as the patients had a

tendency to increase the radiation time in the hope that a cure might be more quickly effected.

"The pulse, temperature, respiration and blood pressure were observed before, during and at the end of the radiation periods."

During the winter season in certain parts of the world it is impossible to use the sun's rays therapeutically; therefore, we are fortunate in that we may substitute the rays of the quartz mercury vapor lamp. Some workers believe that the rays from this lamp are less valuable, while others believe that for certain conditions they are more valuable than the sun's rays. One disadvantage of the lamp is that it requires electric current. There are on the other hand definite advantages such as (1) the intensity of the rays, which is always approximately the same; (2) the treatments may be taken at any time during the day or night and at any season of the year. Because of these advantages some patients prefer to use the lamp throughout the year. For a number of years I have used the Alpine lamp. Patients who are physically able, come to the office for their treatments. Most patients require much rest and conservation of energy; therefore, a trip to an office every day or even two or three times per week is definitely contraindicated. In such cases, I have obtained excellent results by possessing a sufficient number of Alpine lamps for use in the homes. A lamp is installed in the home where the patient has its exclusive use. The patient is then kept under careful supervision while heliotherapy is being administered.

At this time I desire to present four cases who have been treated by natural and artificial sunlight.

Case 1. This lady of forty years was first given a diagnosis of tuberculosis in July, 1921. She had an extensive process involving the left lung. Artificial pneumothorax was begun in September, 1921, and she was admitted to the Glen Lake Sanatorium in October, 1921. While there, artificial pneumothorax was continued. After admission to the Sanatorium she developed symptoms somewhat suggestive of tuberculous enteritis. Careful examination there revealed questionable tuberculosis of the cecum. She was discharged from the Sanatorium in May, 1922. Inasmuch as the abdominal symptoms continued long after her return home she was advised to take heliotherapy. Alpine lamp treatments were begun in February, 1923, and continued until late spring, when natural sunlight was employed until fall. In the late fall an Alpine lamp was installed in her home where she took heliotherapy all winter. In the spring she again resorted to natural sunlight. During all of this time her tuberculous lung has been kept

collapsed artificially. She has gained in weight from 136 pounds upon discharge from the sanatorium to 158 pounds at present. All symptoms of tuberculous enteritis have disappeared and she is now doing her own house work.

Case 2. This man of forty-three years developed a tuberculous epididymitis and was treated surgically in the spring of 1920. He was found to have bilateral apical pulmonary tuberculosis in March, 1921. He was admitted to the Glen Lake Sanatorium in March, 1921, where heliotherapy was carefully administered. After discharge from the sanatorium in October, 1922, he developed a business enterprise which makes it possible for him to direct his own physical activities. He is so firmly convinced that heliotherapy did him great good that ever since his discharge from the sanatorium he has come to the office regularly for sunlight treatments. His working capacity is excellent.

Case 3. This lady of thirty-five years was first told that she had tuberculosis four and one-half years ago. She was placed on home treatment but in September, 1922, had a relapse. Examination in November, 1922, revealed extensive tuberculosis of the right upper lobe with cavity formation. The left upper lobe was slightly involved. She complained of malaise, loss of strength and loss of weight. She was made a bed patient on November 11, 1922, and an Alpine lamp was installed in her home on December 1, 1922. She improved so as to be able to sit up for one meal Dec. 25, 1922. She was given five minutes exercise per day March 1, 1923. Then her exercise was gradually increased until May 5, 1923, when she developed a severe acute respiratory infection with high temperature. This resulted in a spreading of the tuberculous lesion. She was then made a bed patient until Sept. 1, 1923. Since September, 1923, she has been on graduated exercise and at present her weight is 120 pounds. She is now walking one and one-half hours per day in addition to performing the usual duties about her home.

Case 4. This man of thirty-five years was informed that he was suffering from pulmonary tuberculosis in the summer of 1919. In November, 1919, he entered a sanatorium from which he was discharged in February, 1920. In the spring of 1920 he had a severe hemorrhage, after which he was placed on absolute bed treatment until February, 1921. He states that from this time until February, 1922, he spent considerable time resting in bed but also took some physical exercise. In February, 1922, he went to work, but in the late summer some of his old symptoms recurred. At the same time he was told that a myocarditis had developed. He then became a bed patient again until November, 1922, when his tonsils were removed because it was thought that they were definitely infected. He then continued home treatment until April, 1923, when his appendix was removed because of abdominal symptoms and signs suggestive of appendicitis and tuberculous enteritis. After removal from the hospital to his home he was told that he was suffering from tuberculosis of the intestine and that further treatment would be of no avail. At this time the wound following laparotomy was discharging considerable pus, he had a marked tuberculous cervical adenitis on the right side. There was definite evidence of an extensive tuberculous process involving the upper lobe of the right lung and a less extensive process

in the upper lobe of the left lung. His temperature was ranging from 100 to 104 degrees daily. He complained of distressing pain over the abdomen, nausea and vomiting, four to five bowel movements per day, loss of appetite and loss of weight to 94 pounds. In July, 1923, an Alpine lamp was installed in his home. In just a few days his skin began to show evidence of tanning and within a week his appetite began to reappear. As the tanning progressed the vomiting stopped, the abdominal pain disappeared, the abdominal wound healed, the temperature became normal and the body weight began to increase. In due time he was placed on graduated exercise and in February, 1924, he returned to work. He has now worked slightly longer than one year and has gained from 94 to 170 pounds. Although he now has an excellent working capacity, he keeps under close medical supervision and is very co-operative.

I desire to make it clear that I do not believe heliotherapy is in itself sufficient in the treatment of any case of tuberculosis. However, when carefully administered with the other therapeutic procedures indicated in each individual case I have found it of tremendous value. I have become thoroughly convinced that heliotherapy has a four-fold value. First, it acts as a tonic. It has been shown to change the blood picture and probably the blood chemistry in a manner favorable to the patient. Second, it induces the patient to rest quietly while the exposure is being made. When the periods of exposure are long this period of rest becomes an important factor in the treatment of the patient. Third, in addition to the sun bath the patient gets an air bath which is of unquestionable value. Fourth, it is a tangible form of treatment—the patient sees the skin becoming pigmented and feels definitely improved from time to time. Not infrequently by the administration of heliotherapy it is possible to keep a tuberculous patient on the dietetic and hygienic treatment for months after all treatment would otherwise be abandoned. Therefore, the physician who employs heliotherapy will be able many times to secure an arrest of the tuberculous process and a restoration of the working capacity, whereas without heliotherapy no better than a condition of quiescence could be secured.

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ADVANTAGES OF DIRECT CYSTOSCOPY*

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There are numerous adherents both of direct and indirect cystoscopy. However, it should be recognized that each method possesses advantages which are lacking in the other and the urologist should be adept in the use of both. The direct cystoscope of Braasch, which is a modification of the Elsner and Koch cystoscopes, is the commonest type in use (Figs. 1 and 2). The principle of using a water medium with direct cystoscopy was



Fig. 1. The Braasch direct cystoscope showing the obturator in place.

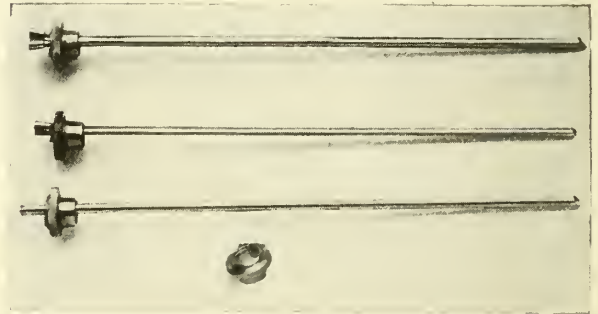


Fig. 2. The single, caliber No. 9, the double and the triple catheterizing guides of the Braasch cystoscope. The ocular window is for purposes of observation.

suggested by Millet in 1904. Of the many indirect types, the Brown-Buerger cystoscope is probably the most widely used. Among others may be mentioned the Bransford Lewis Universal cystoscope, the George Wolf cystoscope and the McCarthy cysto-urethroscope. There have been various modifications of the indirect type for special work, such as rongeurs, specimen-takers, and lithotrites. The new McCarthy cysto-urethroscope has included some of the principles of both the direct and the indirect cystoscopes.

*Submitted for publication February 3, 1925.

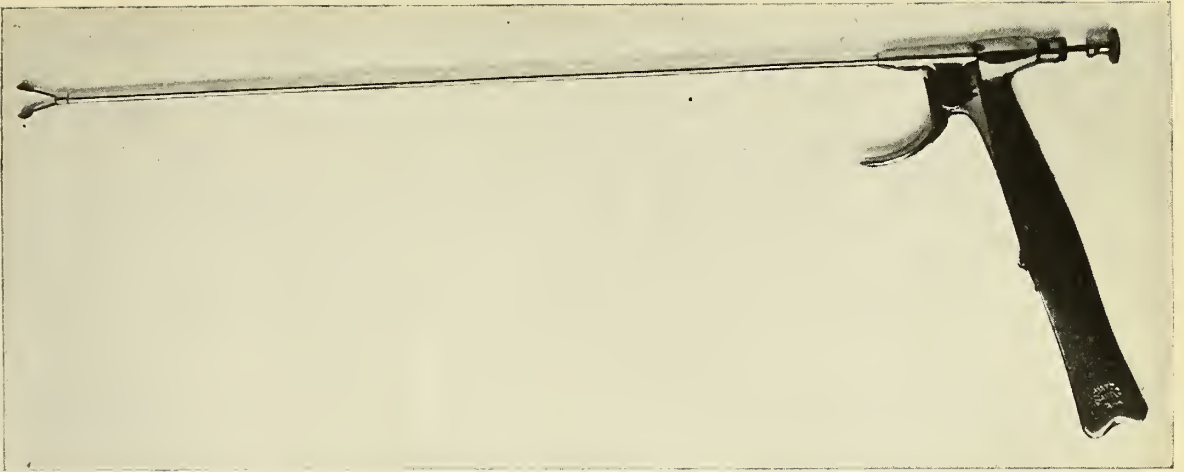


Fig. 3. Rigid specimen-taker.



Fig. 4. Rigid specimen-taker.

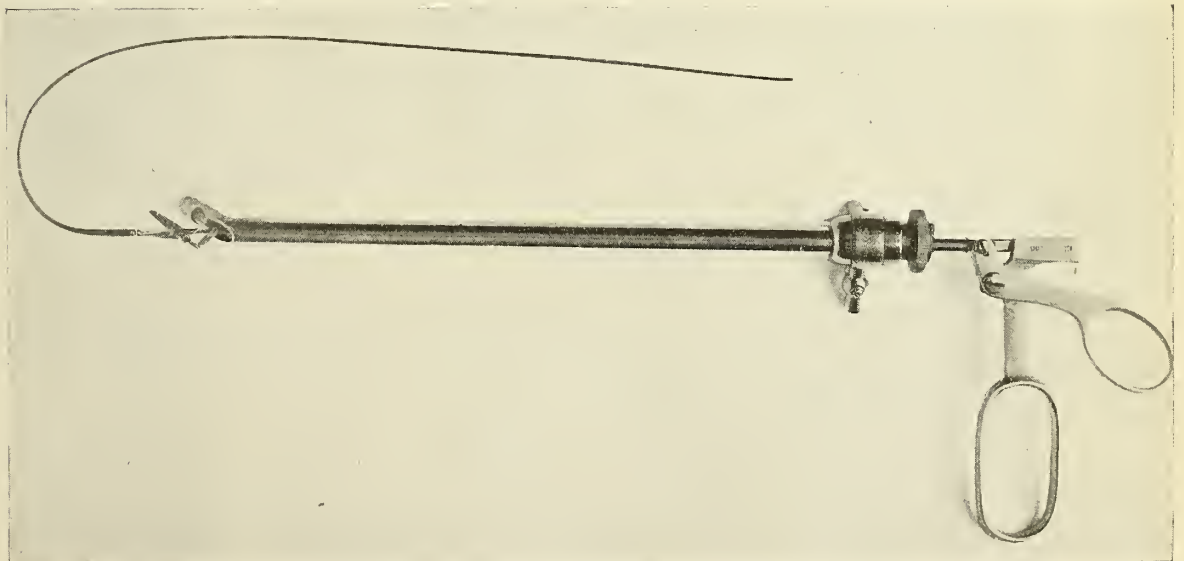


Fig. 5. The Bumpus ureteral meatotomy scissors with a filiform mounted on one blade.

The main difference between the direct and the indirect-vision cystoscopes is that the former consists merely of a hollow tube with a window at one end through which the bladder is viewed, while the latter is made with a lens which gives a "periscope" view of the bladder. This fundamental difference in the two types naturally gives rise to various advantages and disadvantages peculiar to each.

ADVANTAGES OF THE DIRECT CYSTOSCOPE

1. With the direct cystoscope the bladder itself is viewed, whereas with the indirect cystoscope only a reflected, and somewhat distorted, image is seen.

2. The direct type is particularly useful in facilitating the removal of specimens from tumors of the bladder for diagnosis. A rigid specimen-taker is infinitely superior to a flexible one, which must necessarily be used with an indirect cystoscope (Figs. 3 and 4). In obtaining a specimen the barrel of the cystoscope is pressed against the tumor in such a manner as to fix it. The window of the cystoscope is then removed and the specimen-taker inserted. The microscopic examination of the tumor not only establishes whether it is malignant, but how malignant it is, and so determines the method of treatment.

3. The direct cystoscope is very useful in removing foreign bodies from the bladder. Catheter heads, pieces of rubber tissue, hairpins, and LaForte filiforms, and so forth, occasionally found in bladders, can usually be removed easily in the same manner as specimens. A string loop threaded through the eyes of a ureteral catheter is often used for the removal of sharp objects, such as hairpins.

4. Stone in the bladder, after it has been crushed by a lithotrite, can be removed by the aid of the direct cystoscope. The instrument is manipulated until its beak is adjacent to a collection of the fragments, the window is then removed and the particles are forced out with cystoscopic fluid by the expulsive power of the bladder.

5. The operation of ureteral meatotomy can be accomplished successfully through the direct cystoscope. Flexible meatus scissors do not have sufficient rigidity to permit successful cutting. Recently Bumpus has devised rigid meatus scissors with a LaForte filiform mounted on the end of one blade. These scissors can only be used through a direct cystoscope (Fig. 5).

6. The direct cystoscope permits the insertion of three, and sometimes four, No. 6 ureteral catheters into one ureter for the purpose of manipulating stone in the ureter. A three-way catheterizing guide invented by Braasch permits the simultane-

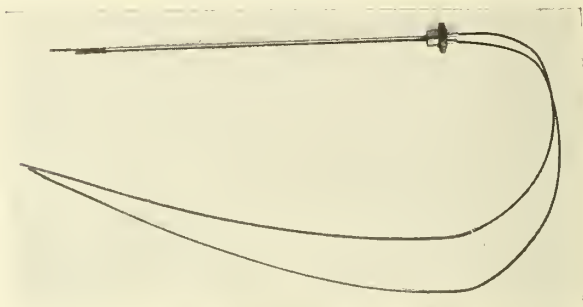


Fig. 6. The double catheterizing guide, with catheters in position.

ous introduction of three No. 6 ureteral catheters into one ureter (Figs. 6, 7 and 8). The cystoscope is withdrawn, and a small, single catheterizing guide cystoscope re-inserted alongside the three ureteral catheters, and a fourth catheter placed in the ureter. Forty-eight hours later, after the injection of a lubricant, all four catheters are removed by a twisting motion, which will frequently bring the stone. If the stone is not delivered immediately, the dilatation is sufficient for it to pass, in 70 per cent of the cases, within the next forty-eight hours.

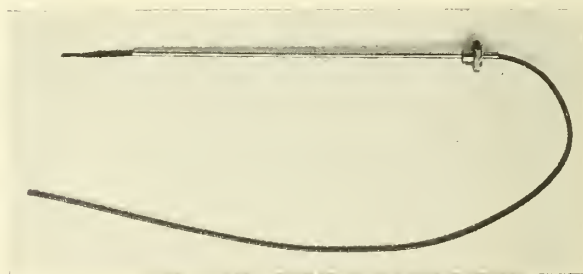


Fig. 7. The triple catheterizing guide, with catheters in position.

7. Various medications may be applied to the bladder through the direct cystoscope. Other methods of treatment, such as curettage, are also possible.

8. The direct cystoscope combines cystoscope with urethroscope. In every cystoscopic examination, the posterior urethra should be examined. The indirect cystoscope is not suitable for endoscopic work because the magnification distorts the

field and makes interpretation exceedingly difficult. With the Braasch cystoscope a complete examination of both bladder and urethra can be made.

9. The direct cystoscope is ideal for examining hemorrhagic fields. With the indirect cystoscope, the field of vision is blurred as soon as the medium becomes bloody, because the field of vision cannot be washed by the cystoscopic fluid. With the direct instrument the field of vision and the field that the fluid enters are the same. The fluid continually washes away the blood and permits visualization of the bleeding point.

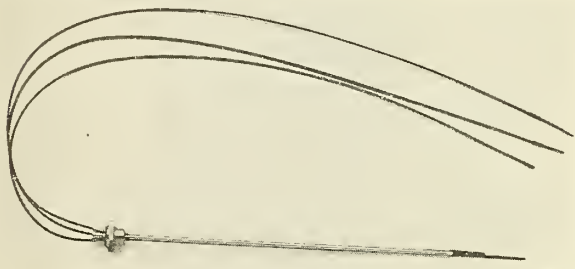


Fig. 8. The large single catheterizing guide carrying a No. 9 Garceau catheter.

10. The direct cystoscope is a simple instrument, and does not require all the accessories necessary to the indirect cystoscope. It does not contain lenses or get out of order readily. It does not have to be handled with exceeding care, and can be sterilized easily.

THE DISADVANTAGES OF THE DIRECT CYSTOSCOPE

1. The direct cystoscope may, in some cases, cause slight pain when the ureters are catheterized. There is, however, but little difference in the severity of postcystoscopic reactions.

2. The direct cystoscope is not as satisfactory as the indirect for examining and treating lesions located in the dome and the anterior wall of the bladder. In a few cases the angle of the posterior urethra with the bladder may not permit a complete view of these parts. For this reason if the dome and the anterior wall of the bladder are to be examined for tumor or for pan-mural ulcer, it may be advisable to use an indirect cystoscope.

3. The direct cystoscope shows a smaller field than the indirect, but this is of very little practical consequence.

4. The direct cystoscope does not give a magnified view of the bladder and the details of the mucosa cannot be so clearly visualized.

COMMENT

It is readily seen that the main objection to the direct cystoscope is that it cannot be used in the treatment of the dome and anterior wall of the bladder. Aside from this it can be used just as readily for all types of cases as the indirect cystoscope, besides possessing many distinct advantages over the latter. It is used in approximately 95 per cent of all cystoscopic examinations at the Mayo Clinic. However, in order to render adequate cystoscopic service, one should be entirely familiar with both direct and indirect cystoscopy, and the type of instrument used should be that which is best suited to the peculiarities of the individual case.

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IRON CITRATE GREEN-P. D. & CO. ACCEPTED FOR N. N. R.

The Council on Pharmacy and Chemistry explains that iron citrate green-P. D. and Co. has been accepted for New and Non-official Remedies. In the past, the Council has reported that the so-called iron citrate green and solutions of it intended for subcutaneous or intramuscular administration had been found inadmissible to New and Non-official Remedies because no evidence had been presented to show that the green iron citrate had any advantages over the pharmacopeial iron and ammonium citrate, and because there was no evidence to show that the subcutaneous or intramuscular administration of iron preparations was rational. Parke, Davis & Co. has submitted evidence

to show that the injection of solutions of the official iron and ammonium citrate and of certain brands of green iron citrate produce pain. The firm adopted the use of a green iron and ammonium citrate containing the equivalent of 8.1 per cent of amonnia. The Council is not convinced that the hypodermic or intramuscular administration of iron yields effects which differ from those obtained by the oral administration. However, the uncertain state of iron therapy and the rather large clinical use of iron by subcutaneous or intramuscular injection, combined with the lack of danger from this method of use, appear sufficient to warrant the provisional acceptance for New and Non-official Remedies of iron preparations intended for subcutaneous or intramuscular use. (*Jour. A. M. A.*, Apr. 4, 1925, p. 1045.)

ACUTE PANCREATITIS*

DISCUSSION OF SEVEN CASES

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Acute pancreatitis, or acute pancreatic necrosis, as it may more appropriately be named, should be a subject of interest to nearly all of us. It is liable to enter prominently, suddenly, and dramatically into our experience at any time. If we are not watchful, the curtain may go down on the last act before we are well awake to our cue for the first act.

Symmers¹ of Dublin in 1917 reported a series of cases in which death was so sudden and so absolutely unexplained that a coroner's inquest was necessary in each case to determine the cause of death. Other authors have also reported cases ending in death within a very few hours.

CASE 1: In the first case of this series, death occurred within 48 hours. A young healthy nurse was seized at 4 A. M. with vomiting, air hunger, and agonizing pain in the epigastrium. Sir Berkeley Moynihan² says: "The first and chiefest symptom is pain; and of all the pains that the human body can suffer, this is the worst." When this woman was seen by a surgeon later in the day, his examination revealed a rigid upper abdomen, a very rapid pulse (144), and only slight fever (99.5). The urine showed much albumen, casts, acetone and diacetic acid, and a marked glycosuria. Operation was performed at once, twelve hours after the onset of pain, under the diagnosis of perforated duodenal ulcer. The stomach, duodenum, gall-bladder, and kidneys were normal, and there was neither peritoneal inflammation nor fat necrosis. Death occurred, in coma, within 48 hours after onset of the pain. Autopsy showed no pathology excepting acute necrosis of the head of the pancreas. The head of the pancreas was hard and red, but there was no free fluid in the peritoneal cavity, and no areas of fat necrosis were found.

Death, in such cases suffering profound shock and very early death, is generally ascribed to the absorption of split protein products from the digested pancreatic tissue. According to Archibald³, with whom most authorities agree in this respect, "the fundamental lesion is a necrosis of the parenchyma, a necrosis apparently caused by the action of a powerful chemical irritant rather than by bacterial inflammation." The powerful chemical irritant is generally agreed to be trypsin—in other words, the harmless trypsinogen of the

pancreatic juice has been activated within the gland itself by the action of some extraneous substance. The activation, according to some authors, is due to infection carried from the gallbladder or other nearby organ to the regional lymph nodes, and then by retrograde extension through the lymphatics into the pancreas. According to other authorities, the activating agent is some extraneous substance, such as bile or duodenal contents, carried up into the pancreas through the duct of Wirsung or the duct of Santorini. The problem has been widely studied, and is still under discussion.

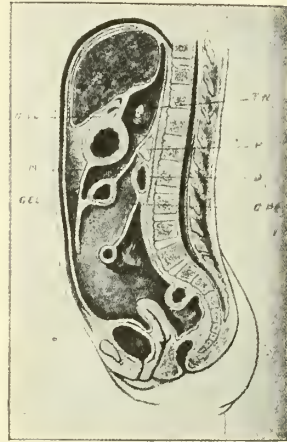


Fig. 1. Plate reproduced from Archibald (3), showing the relation of the pancreas to the greater and lesser peritoneal cavities, and to the stomach, colon, duodenum, and the retroperitoneal space. (Modified from Piersol.)

Some maintain that the disturbing factor enters always by way of the lymphatics; some that it enters always through the pancreatic ducts; and some that there are two types of pancreatitis, an acute pancreatic necrosis due to a disturbing element entering through the ducts, and a chronic inflammatory lesion due to infection entering through the lymphatics or the blood stream. In the first case of my series it would seem that the ducts must have carried the activating substance.

In this same case it is remarkable that no scattered areas of fat necrosis were found. Some authors describe fat necrosis as a condition always found. However, cases without fat necrosis have been reported, usually when the disease was so severe as to cause very early death. Prat⁴ of Montevideo, Uruguay, has recently reported two cases without fat necrosis. One robust young man died less than eight hours after the sudden onset of continuous agonizing pain with rapid filiform

*Presented before the Hennepin County Medical Society, March 11, 1925.

pulse; there were no other appreciable symptoms. In his second case, that of a man twenty-eight years old, operation in the sixteenth hour showed an enlarged hard pancreas but no fat necrosis. Recovery followed drainage of the gall-bladder.

And now before leaving our first and most tragic case we must consider one other feature—the observation of glycosuria and coma. The patient was seen in March, 1917, before the days of insulin; perhaps she would have had a better chance today. In January, 1924, Rodriguez⁵ of Fort Wayne reported a case of acute pancreatitis complicated by diabetic coma in which insulin in large amounts reduced the blood sugar content from over 600 mgm. per 100 c.c. to less than 100 mgm.

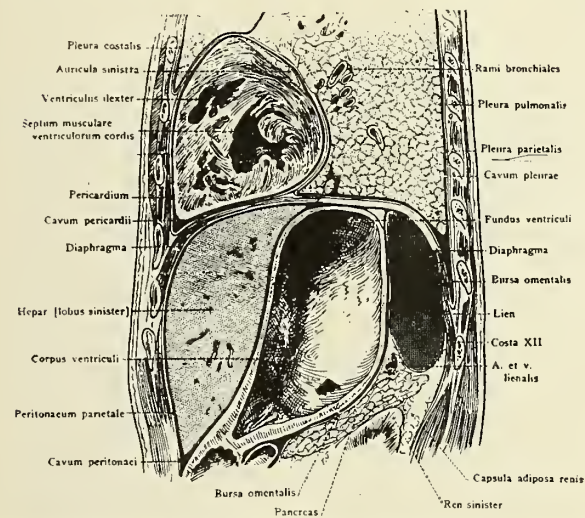


Fig. 2. Lateral sagittal section through the left thorax and upper portion of abdomen, viewed from the left. The plane of the section lies 4 cm. to the left of the median plane.

Fig. 2. Plate reproduced from Manual of Surgical Anatomy, U. S. Army Medical Department, 1918, p. 151, showing the relation of the pancreas to the left lumbar region. Lateral sagittal section 4 cm. to the left of the median plane.

However, the patient, after improvement for some days, died rather suddenly in coma with a blood sugar of 360 mgm., a victim, it was thought, of total pancreatic insufficiency. So, perhaps, insulin would have altered the outcome in our nurse who suffered from necrosis of only the head of the pancreas.

CASE 2: Acute pancreatitis is not usually quite so fulminating. A man fifty-eight years old had an attack of gallstone colic with jaundice twenty-eight years ago, and several short attacks during the last year. On July 30, 1920, in the afternoon, he was seized with a sudden very severe pain in the epigastrium. By the time he reached home he was in such profound stock that he could not be carried to his apartment on the second floor. There was

no vomiting. Temperature and pulse were normal. Tenderness was present in the left hypochondrium. On the third day the temperature continued normal and the pulse was only 90. There were pain and tenderness in the left hypochondrium and through to the left lumbar region, but there was no tenderness over the gallbladder. There was dullness in the flanks and a bluish discoloration of the skin there, this latter being a very significant sign.² There was slight tympanites. A diagnosis of probable acute pancreatitis was made. On the next day, August 2, he was more restless. The temperature was normal, but the leucocyte count was 18,000 and the urine contained albumen and many granular and hyaline casts. On August 4, after a night of restlessness and delirium not controlled by morphin, the patient was admitted to the hospital. The pulse rate exceeded 100, but the temperature was still normal. The urine was scanty and contained more albumen and casts; the leucocyte count was 17,000. There was more resistance in the left abdomen and more dullness in the flanks. The condition of the patient did not warrant operation. His delirium continued, his pulse became more rapid, and he died that same evening, five days after onset of the illness.

Autopsy showed free bloody fluid in the peritoneal cavity, extensive scattered extraperitoneal and perirenal fat necrosis. There were many small calculi in the gallbladder and common bile duct, but none at the ampulla of Vater. The pancreas demonstrated the typical acute pancreatic necrosis of severe grade. The pancreas was fully four times its normal size, dark red to black in color, and hard. The scattered small areas of chalky grey fat necrosis in the peripancreatic fat were prominently visible.

The question of the relation of this man's gallstones to his acute pancreatitis is of special interest. One of two things may have happened. First,



Fig. 3. Cut section of pancreas from Case 2 showing the necrosis of the gland and the dull white areas of fat necrosis.

one of the small stones may have lodged at the outlet of the ampulla, blocking it and converting the common bile duct and pancreatic duct into one continuous passage. Some of the obviously diseased and chemically altered bile would then have

entered the pancreas and activated the pancreatic secretion within the gland itself. Such a stone might have receded up the common duct or have been passed into the duodenum before the time of the autopsy. Second, a temporary paralysis of the sphincter of Oddi by passage of a small calculus may have allowed duodenal contents to pass up the pancreatic duct. That also would have activated the pancreatic fluid within the gland. In either case the complete blockage of the exit must have been of short duration, as the patient was at no time jaundiced.

This patient was observed by me only on the last day of his life and at autopsy. After his admission to the hospital he was in no condition for operation; as to the operability on August 1st, when the diagnosis was first suggested, I do not know. At the time that the patient was under observation many authorities were advocating delay in operation until recovery from the initial shock. More recently most surgeons have come to agree that operation as soon as possible gives the best prognosis in these cases. The prognosis is, of course, extremely grave under any management.

CASE 3: This next case illustrates a somewhat less rapid course of the disease. The patient was operated within a few days after the onset of his illness and lived about three weeks. For years before his final illness he had had attacks of pain in the lower abdomen. Four, and again two months ago, there had been attacks of acute pain in the upper abdomen, which had been diagnosed as gallstone colic. Six days before entering the hospital he began to have severe upper abdominal pain unrelated to meals; during the last two days the pain had been very severe and continuous. Temperature and pulse were normal. He had been given morphin by his physician before being sent to the hospital, but nevertheless one and one-half grains were required in the twelve hours between his admission and the operation. Examination on admission showed slight distention of the abdomen, marked rigidity and muscle spasm of the upper abdomen more especially to the right, and marked tenderness in the epigastrium extending from the right over to the left hypochondrium. The extension of the tenderness to the left upper quadrant is recognized as an important sign in the differential diagnosis of acute pancreatitis.^{2,3} The same sign has been noted in the second case of this series.

Operation showed the gallbladder and bile ducts to be normal and free from stones. There was a quantity of bloody serum free in the peritoneal cavity. There were areas of fat necrosis in the omentum and in the fat at the root of the transverse mesocolon. The pancreas was red, swollen, and hard throughout. Drains were inserted and the abdomen closed.

The patient's general condition gradually improved, but there was digestion of the edges of the wound so that the

upper part gave way four days later, and a second operation became necessary. When the lesser peritoneal cavity was opened, the pancreas was found to be smaller and less red, but it contained several abscesses, the largest about the size of a hazel nut. *Staphylococcus aureus* was grown in a culture from one of the abscesses. Five or six longitudinal slits were made into the pancreas, and drains placed down to the pancreas. The patient improved temporarily a little, but the temperature soon again rose, with rapid pulse and respiration, and leucocytosis. The wound edges again were digested and gaped. The patient gradually grew weaker and died twelve days after the second operation, and twenty-three days after the onset of his final illness.

Autopsy showed extensive fat necrosis. The pancreas was necrotic—partly hard and dark red, partly soft and disintegrated; the head of the organ was the only part approaching normal. The common bile duct was somewhat dilated, especially near the ampulla, but no stones were found. The liver and gallbladder were normal. There

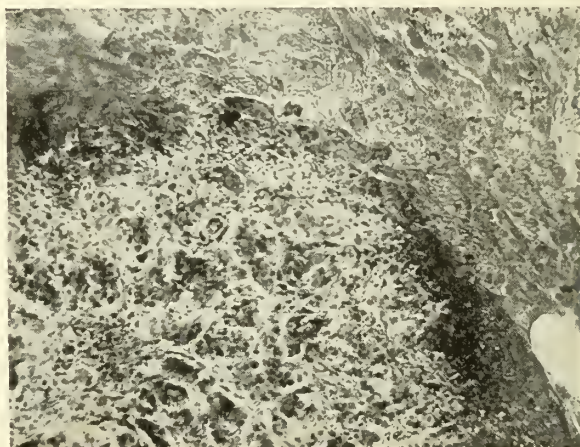


Fig. 4. Photomicrograph from Case 2 showing the margin of a necrotic area. Note the leucocytic infiltration and small hemorrhages in the neighboring tissue.

was a fairly large ulcer in the lesser curvature of the stomach, surrounded by only a moderate degree of inflammatory reaction.

In reviewing this case, we must assume that the previous recurrent attacks of abdominal pain, in the absence of gallbladder disease, were due to earlier attacks of pancreatitis. Although the attacks could not be traced directly to the gastric ulcer, still the ulcer may well have played a part in the causation of the pancreatitis. The association of the two lesions has been noted a number of times, and various explanations have been suggested.

To summarize our third case, we had a patient who had probably suffered a number of attacks of mild acute pancreatitis with spontaneous recov-

ery. At last he suffered a severe and extensive involvement of the gland, was operated, and drained with resultant improvement. Then the wound opened through digestion of its edges by the pancreatic juice, and we saw the sequel in the gland—localized areas of softening with secondary infection. Drainage of the abscesses helped for a time, but he died finally from sepsis and pancreatic insufficiency.

CASE 4: The fourth patient, a man of 53 years, it was my privilege to watch through the last two months of his life; he lived for four months after the onset of his final illness. He was perfectly well until January 11, 1921, when he was suddenly seized, while shaving, by a severe colicky pain in the lower abdomen with vomiting. He was taken to a North Dakota hospital, where he remained for three weeks. His bowels did not move, nor did he expel flatus for nine days. Obstipation is an early and often a very confusing symptom of acute pancreatic necrosis. Pain subsided only slightly after the bowel movement. The bowels moved daily thereafter with cascara. After three weeks he was moved to another hospital and late in February to one of the larger Minnesota hospitals. There an operation was intended for probable carcinoma of the colon, but he went into collapse in the operating room before anything was done or any anesthetic given. The operation was cancelled and he was sent home as being too poor an operative risk.

He was admitted to St. Mary's Hospital of Minneapolis on March 7, 1921, two months after onset of the illness. His weight had decreased from 220 to 175 pounds. A heavy burning feeling in the lower abdomen had persisted, and he was still constipated and distended. The abdomen contained a large firm rounded mass which filled the entire upper abdomen and much of the right lower quadrant; it was situated deeply, moving only slightly during respiration. The feces were normal; the Wassermann test was negative; urine was practically normal; leucocytes numbered 7,600 and erythrocytes 3,900,000; the hemoglobin was 65 per cent. Roentgenographic examination with the aid of a barium meal showed the left diaphragm higher than the right; the stomach high to the left; and the barium going from the stomach high up and far to the right, and thence down to the lower abdomen into the small intestine; the transverse colon was apparently in normal position. A large empty area, surrounded by an apparent capsule, occupied most of the abdominal cavity in a central position. Barium enema showed partial obstruction of the transverse colon near the hepatic flexure; the flow of barium stopped at that point, but later a little leaked beyond and into the cecum.

Operation was performed on March 17. Masses of fat necrosis in the omentum drew immediate attention to the pancreas. A large deep abdominal mass was exposed through the gastro-colic omentum; it was a very large retroperitoneal pseudo-cyst presenting directly behind the transverse colon and occupying by far the greatest part of the abdomen. Its surface was irregularly studded with patches of fat necrosis. It contained a very cloudy but thin gray-green fluid; a very large amount (perhaps two gallons) was

removed, containing no bacteria and no demonstrable pancreatic ferment. The cyst was drained.

The patient improved markedly for about a week, after which he developed an afternoon fever. About twelve days after operation skin digestion began to be evident at the drainage site. On April 11, there was a hemorrhage of 150-175 c.c. from the wound. The hemoglobin had been steadily dropping since his entrance into the hospital, and this hemorrhage did not help matters. By April 22, the hemoglobin had dropped to 38 per cent. The tube was often plugged by necrotic debris so that it had to be repeatedly washed and reinserted. An earlier unsuccessful attempt had been made to dispense with the drainage tube. On April 23, counter-drainage was established in the left flank just in front of the kidney. At that time the cyst had contracted to a diameter of about 4 or 5 inches and was filled with cheesy material. On April 27 the patient received a blood transfusion. On May 1 he lost about 150 c.c. of blood through the drainage tube. His appetite had gradually failed, and he had started to vomit more and more, so that he was finally unable to retain anything. He died on May 10, 1921, from exhaustion, with subnormal temperature.

Autopsy revealed no trace of living pancreatic tissue, but only some necrotic debris at the site of the pancreas. The posterior part of the cyst wall was still present, but microscopic section (Fig. 5) shows no real cyst lining. The necrosis had extended downward retroperitoneally far beyond the pancreatic area. There was no gross evidence of infection.

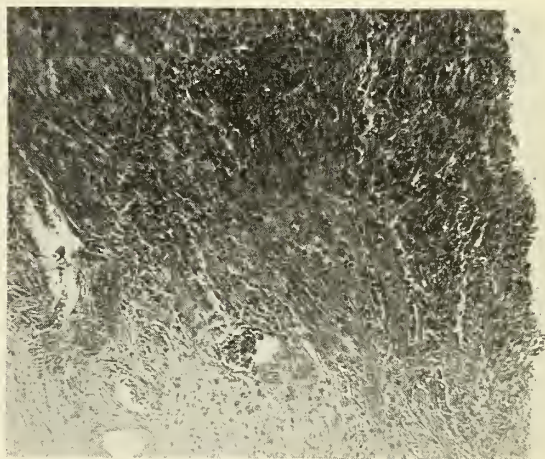


Fig. 5. Photomicrograph from Case 4 to show the wall of the pseudocyst. Note the absence of lining membrane and the marked leucocytic and fibrous tissue reaction.

Here, then, was a patient who suffered an attack of acute pancreatitis, and spontaneously overcame the immediate danger. He then lived for four months with steady loss of weight and strength. The process was only fairly well walled off with formation of a pseudo-cyst, but with gradual extension of the necrosis. The spread of the necrosis went on in spite of good drainage. The

patient finally died of total pancreatic insufficiency. The factor of secondary infection did not apparently have a part in the progress of this case. Delbet⁶ cited a case in 1924 in which formation of a pseudo-cyst occurred after an attack of acute pancreatic necrosis. In that case also the content of the cyst was sterile.

Although the two hemorrhages were not predominant factors in causing the death of our patient, they call attention to one of the complications most to be feared. Deaver⁷ particularly has emphasized the danger of large post-operative hemorrhages. Of course hemorrhages are not limited to the post-operative period. Moench⁸ of New York in 1924 reported the case of a woman who died unoperated within eight hours after the onset of her illness, the abdomen, at autopsy, being found to contain quarts of fluid blood. The evident source of the hemorrhage was a necrosis of the splenic artery where it lay in contact with a necrotic bile-stained area of the pancreas one-fourth inch in diameter and one inch long.

CASE 5: Now, for a change, let us consider a patient who is alive and quite well today. This stout woman, sixty-two years old, suffered an attack of upper abdominal pain with jaundice three years ago, since which time she complained persistently of "stomach trouble." On November 24, 1924, she began to have abdominal pain; on November 25 it became severe and she vomited. During the night of November 26 the pain was so severe that it was not controlled by over 3 grains of morphin in one-half to one grain doses. The pain was felt principally in the upper abdomen. She vomited continuously, although she took no food. She was admitted to St. Mary's Hospital on the morning of November 27. Temperature, pulse, and respiration were practically normal. There was definite tenderness over the gallbladder and in the right loin, but the really extreme tenderness was found in the epigastrium and extending to the left of the mid-line, a sign strongly suggesting pancreatitis. There were no palpable masses, and there was no rigidity. The leucocyte count was 19,000; the urine showed much bile and very many granular casts; the blood contained greatly increased amounts of creatinine and urea nitrogen. It was felt that the patient would not stand operation. By December 8 the casts had disappeared from the urine, the leucocyte count was 8,000, and the blood chemistry was normal.

Operation on December 11 (17 days after onset of the illness) disclosed some scattered areas of fat necrosis, but not a very marked enlargement or hardness of the pancreas. The gallbladder was distended, red, and thickened; it contained many stones and thick dark brown fluid; there were stones in the cystic duct; one stone was found outside the gallbladder enclosed in adhesions. The gallbladder was removed and drains placed to the stump of the cystic duct and to the fossa behind the portal vessels.

Convalescence was stormy for a time with the temperature reaching 101 for a few days, and with some drainage of bile. However, recovery was good. The patient went home on January 11 feeling quite well.

This was a very serious case of cholecystitis and cholelithiasis, associated with an acute pancreatitis, which latter was subsiding at the time of operation. That brings us to another problem—the prevention of future attacks of pancreatitis. Our patient was recovering from the pancreatitis spontaneously. But all the factors were at hand for the development of another and possibly fatal attack in the future. Drainage of the pancreatic capsule would do no good in this case. Certainly cholecystostomy would not fill the requirement for a gallbladder already perforated. Cholecystectomy seemed indicated and was carried out, with a good result thus far. In cases operated at the height of a severe acute pancreatitis one would usually be limited to drainage of the pancreatic capsule, with, at most, a cholecystostomy or drainage of the common bile duct. Cholecystectomy, and perhaps even cholecystostomy would have to be left to a later operation.^{2, 9}

And now finally we will consider the occurrence of rather mild acute pancreatitis, as it is found in elderly people of low vitality, carrying them off rather through their lack of resistance than through the severity of the lesion.

CASE 6: A woman sixty-three years old gave a history of recurrent attacks of slight pain low in the left side of her abdomen every three or four months during the last thirteen years. Two months before death she had a sudden attack of weakness with loss of appetite but no marked pain. She vomited bile and mucus at times and lost weight. She ate very little and became progressively weaker, having spent the last three weeks in bed. Examination showed a marked cardiac arrhythmia. There was a palpable, rather tender mass in the epigastrium, extending to the left and pulsating; the pulsation was not expansile and the aorta was palpable to the right of the mass. The clinical diagnosis was a malignant tumor of undetermined nature.

Autopsy disclosed, in the pancreas, near its tail, an area of softening surrounded by necrotic tissue and small patches of fat necrosis. Areas of fat necrosis were found around the pancreas and in the omentum. On section of the gland, several small calcareous masses were found in, and in the region of, the ducts, but there was no evidence of carcinoma.

CASE 7: By way of comparison, let me mention the case of an elderly man who died in 1912.* For five weeks he had suffered from extreme gastric irritability. At various times there had been transitory spots of tenderness all over the abdomen. There were felt at different times, indefinable masses, the most constant being in the median line

*History and specimen from the Department of Pathology, University of Minnesota.

midway between the navel and the zyphoid. Autopsy revealed pus pockets and infiltration in the tail of the pancreas, along its midportion, and around the head of the gland. There were scattered particles of fat necrosis.

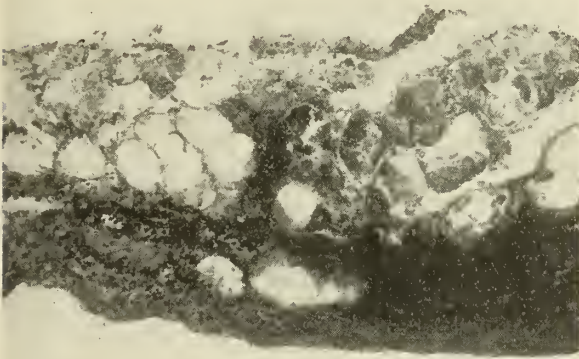


Fig. 6. Photomicrograph from Case 6 showing the contrast between the appearance of the normal fat and that which had undergone fat necrosis.

Pathologically these two cases displayed simply milder degrees of the same disease found in the first cases reported. But how different is the clinical picture! In the last two cases we saw a wasting away without much pain, while in the first we saw what Sir Berkeley Moynihan² calls "the most terrible of all the calamities that occur in connection with the abdominal viscera."

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THE CLINICAL INTERPRETATION OF GLYCOSURIA*

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The great majority of individuals with persistent glycosuria are diabetics. A transient glycosuria, however, is frequently encountered and as a rule is not associated with a diabetes mellitus. The correct evaluation of such a finding is therefore most important. A mistaken diagnosis may lead to unnecessary restriction of diet or an unjust refusal of life insurance. On the other hand to overlook an early diabetes is an even more serious mistake. A necessarily partial review of the voluminous literature on the subject has been undertaken and an attempt at a summing up of the subject is here presented.

NORMAL CARBOHYDRATE METABOLISM

Comparatively little of the whole story of carbohydrate metabolism in the human body is known. The first step in the utilization of carbohydrate food is its digestion. Starches are converted in the intestines largely to glucose which is absorbed through the portal circulation and in part polymerized to glycogen in the liver and also in the muscles. Fructose and galactose are similarly absorbed in small amounts. Ingested glucose requires no digestion and its absorption is therefore more rapid than that of starch. According to Shaffer, preliminary conversion of glucose to glycogen before its utilization is not necessary and the utilization of glucose given intravenously is proof that alteration in the digestive tract is not essential. After starvation for two days the liver glycogen has been largely consumed. It has been well established that glucose is derived from protein: possibly glucose may be obtained in small measure from fat.

The fate of the glucose molecule in the tissues is more or less a mystery. According to Shaffer there is evidence that lactic acid is produced from glucose in the blood, liver and kidneys and probably wherever glucose is metabolized, although the succession of steps in the breaking down of the glucose molecule is not proven. Shaffer states there is no evidence to disprove that the main intermediaries between glucose and lactic acid are

*Presented before the Minnesota Academy of Medicine, St. Paul, December 10, 1924.

glyceric aldehyde, dihydroxyacetone and methylglyoxal. According to Lusk this conversion of glucose to lactic acid is not an oxidative process. It is commonly believed, however, that oxidation of the lactic acid molecule removes it with the production of heat.

The normal blood sugar in a fasting individual is about .1 per cent. After carbohydrate meals a physiological hyperglycemia is demonstrable which, according to Joslin, may rise as high as .17 per cent. The more rapid the absorption of glucose the higher this hyperglycemia, and, depending on the kidney threshold for sugar, which varies in different individuals, sugar may or may not be demonstrable in the urine by means of the usual qualitative tests. Glycosuria *e saccharo* or *ex amylo* is simply a matter of degree. Jacobson showed that glycosuria *ex amylo* existed in five of twenty-four normal individuals tested. This same investigator found that the blood sugar concentration above which sugar was demonstrable in the urine by the usual qualitative tests lay between .16 and .17 per cent.

Recently it has been established that the urine normally contains a reducing substance to the amount of about 1 gram in twenty-four hours. Such small amounts are not detected by the usual qualitative tests in clinical use. It has not as yet been firmly established just how much of this reducing substance is glucose. Benedict and Osterberg found about .07 per cent sugar in the urine normally, about half of which was fermentable.

The recent experiments of Bailey indicate that the blood and urinary sugar concentrations normally correspond closely up to about .16 to .17 per cent, above which figures sugar is actively excreted by the kidneys. These figures are rather high and if correct we are confronted with the possibility of detecting a normal amount of sugar in the urine by the more delicate Benedict's solution. If a normal post-prandial hyperglycemia may rise as high as .17 per cent and the urinary sugar corresponds, normal individuals should frequently show a positive Benedict's reaction an hour or so after a heavy meal. Dr. Margaret Warwick assures me this is not her experience and that an isolated positive sugar reaction with this test unassociated with a diabetes is of uncommon occurrence. She has called my attention to an interpretation of the Benedict's reaction which I do not find mentioned in the standard books on laboratory technic nor in

Benedict's original article. A greenish discoloration of the fluid with an amorphous precipitate she does not consider positive for sugar. A granular precipitate settling to the bottom with a green discoloration is necessary. This point should be emphasized, for this flocculent, stringy precipitate associated with a change of color from blue to green is not infrequently encountered in an aglycosuric urine. It is perhaps needless to add that Benedict's technic must be closely adhered to in questionable cases—that is boiling 5 c.c. of the solution, adding eight drops and again boiling for one to two minutes, after which the solution is allowed to cool for five minutes.

FACTORS AFFECTING CARBOHYDRATE METABOLISM

The liver stores glucose in the form of glycogen when the blood sugar is in excess of the needs of the tissues. When the blood sugar has receded below a certain level glycogenolysis occurs, thus maintaining a blood sugar level normal for that individual. It is not certain how the liver gets the signal whether to store or give out glycogen but it is likely that the pancreas and endocrine glands, notably the adrenal, through their antagonistic actions exert this regulatory influence.

Adrenal.—Stimulation of the adrenals through their sympathetic nerve supply causes an increased output of secretion with a simultaneous elevation of blood pressure and a glycogenolysis in the liver. By this mechanism the muscles receive an increased nutrition.

Various experiments go to prove the effect of the adrenal on the blood sugar. Adrenalin given hypodermically causes a hyperglycemia and may even produce a glycosuria. Repeated injections fail to repeat the effect, which is fair evidence that the failure is due to exhaustion of liver glycogen. No effect is exerted on the kidney threshold. The removal of the adrenal results in a hypoglycemia. In Addison's disease, too, Porges has shown a low blood sugar, which confirms the observations of Eppinger, Falta and Rudinger that a high carbohydrate tolerance exists in this disease.

Nervous System.—Claude Bernard long ago established the fact that a *piqûre* or puncture of the brain in the region of the fourth ventricle produces a glycosuria. A hyperglycemia accompanies this glycosuria. André Meyer found that removal of the adrenal prevented this *piqûre* reaction, thus indicating that stimulation of the adrenal is concerned.

Glycosuria occurs at times with lesions involving the brain such as fracture of the skull, apoplexy, cerebral tumors, meningitis, syphilis of the brain, et cetera. This might be explained as a glycogenolysis, an increased irritability of the brain center in the region of the floor of the fourth ventricle being assumed. Any intracranial lesion may exert an influence on the pituitary gland and, as will be pointed out later, this may explain the associated glycosuria.

Von Noorden holds there is no proof of the existence of a diabetes of purely nervous origin. However, transient glycosuria of psychic or nervous origin is well established. Folin, Denis and Smillie found a slight but appreciable glycosuria in 18 per cent of medical students investigated immediately following examinations. Unfavorable effect of worry on the glycosuria in a diabetic is well known.

The common finding of an elevated blood pressure and pulse on first examination of an individual is rightly interpreted as a manifestation of increased adrenalin output of nervous origin. The coexisting hyperglycemia if sufficient may exceed the kidney threshold, particularly in an individual with a low threshold, and glycosuria result. Here is the logical explanation of the occasional temporary glycosuria encountered in life insurance and routine examinations.

Pituitary.—Disturbances of this endocrine gland have a marked influence on carbohydrate metabolism. Cushing established the relation of the anterior lobe of the pituitary body to skeletal growth and concluded that anterior lobe hypertrophy and hyperfunction result in gigantism in youthful subjects and acromegaly in adults. The posterior lobe of the pituitary has to do with carbohydrate metabolism, hyperfunction apparently lowering the tolerance and hypofunction markedly increasing it. Glycosuria has been frequently found associated with acromegaly. It seemed probable to Cushing that this disease is first accompanied by hyper- and later by hypofunction of the posterior lobe. In the condition known as dystrophia-adiposogenitalis a marked increase in the carbohydrate tolerance is developed and a hypofunction of both anterior and posterior lobes probably occurs. These individuals are always overweight. Cushing administered patients with acromegaly and dyspituitarism as much as 300 and 400 grams of glucose without a glycosuria resulting.

Glycosuria has been found to follow operative manipulation of the pituitary stalk. The glycosuria accompanying recent cranial injuries in as high as 20 per cent as reported by Ogden and Higgins may be due to an effect on the pituitary. Cushing states that in any case of increased intracranial tension from whatever source there probably occur secondary changes in the hypophysis with gross deformation and functional disturbance. He has shown too that posterior lobe extracts given hypodermically may produce hyperglycemia and glycosuria. Macleod states that extract of the infundibular portion of the pituitary *generally* causes hyperglycemia. The posterior lobe of the pituitary seems to be functionally antagonistic to the pancreas. The similarity of its function to the adrenal is further suggested by the hypertrophy of the adrenal medulla resulting after experimental hypophysectomy or disease of the pituitary.

Pregnancy.—The presence of sugar in the urine during pregnancy is not uncommon. When it exists in the last few months of pregnancy, during lactation, or after weaning, lactose is likely to be the sugar present. Glucose, as indicated by the fermentation test, is, however, not infrequently detected during pregnancy. The explanation is not clear. Erdheim and Stumme, in their examination of the pituitary bodies in 150 pregnant women at autopsy, demonstrated a color change from grayish red to white and substantial increase in the average size of the gland, more marked in multiparæ but very definite in primiparæ. Presumably this hypertrophy should be accompanied by hyperfunction and hyperglycemia which would explain a glycosuria. However, Rowley found the average fasting blood sugar normal in pregnancy while Gray reports in 51 cases a normal fasting blood sugar and a normal rise but rather prolonged blood sugar curve after ingestion of glucose. This does not coincide with the conception that hyperfunction of the posterior lobe of the pituitary and the resultant hyperglycemia account for the occasional glycosurias encountered in pregnancy. Frank has shown a lowering of the kidney threshold for sugar during pregnancy. This observation has been made the basis of tests for early pregnancy. One hundred to 150 grams of glucose are given on a fasting stomach and the urine and blood tested in 45 minutes and again in an hour and a half for sugar content. Sugar in the urine with a blood sugar within normal limits is taken as in-

dicative of pregnancy. The test it is claimed is not sufficiently accurate for clinical use except in the first three months of pregnancy. The fact that glycosuria occurs in 40 per cent of glucose tolerance tests using a very similar technic makes it highly improbable that such a functional test for pregnancy will prove of clinical value.

The lowering of the kidney threshold for sugar and the proven pituitary change in pregnancy strongly suggest a relation between the two. Perhaps the pituitary is the regulator of the kidney threshold, hyperfunction lowering the threshold.

Thyroid.—The thyroid gland affects carbohydrate metabolism much the same as the pituitary. Clinically we classify disturbances of the thyroid as well as the pituitary as due to hyper-, hypo- and dysfunction. Borderline cases cannot always be definitely classified. Thyroidectomy has been found to be followed by enlargement of the pituitary, suggesting similarity of function.

In general, hyperthyroidism is accompanied by lowered carbohydrate tolerance. Hopkins has shown blood sugar curves in hyperthyroidism rather typical of diabetes. Hamman and Hirschman found the curve to some extent presenting the high sustained and prolonged features found in diabetes in five cases examined. All five cases showed glycosuria during the tests, one in large amount.

A high carbohydrate tolerance has been considered characteristic of hypothyroidism. Increase in weight is a frequent symptom in this condition.

Several instances of the production of glycosuria by oral administration of thyroid extract have been reported. Garrod found glycosuria in a youth who had been given 5 grains of thyroid daily for six weeks. The sugar disappeared after the medication was stopped.

The internal secretion of the thyroid may be considered antagonistic to the pancreas and in overactivity likely to produce a slight elevation of the blood sugar curve as shown in the usual functional test. Hyperthyroidism therefore should be excluded before interpreting a blood sugar curve.

Drugs.—The long list of drugs which are said to produce a glycosuria is rather startling. Garrod lists morphine, atropine, strychnine, curare, amyl nitrite, copaiba, phosphorus, bichloride of mercury, uranium salts, phloridzin and acetone. Phloridzin is doubtless the best known of those mentioned and produces a glycosuria not by an

elevation of the blood sugar but supposedly by its toxic action on the kidneys. Morphine produces a hyperglycemia probably through stimulation of the adrenals. It has been shown by Stewart and Rogoff that this action of morphine can be counteracted by insulin. Phosphorus and hydrazine exert a toxic action on the liver cells, producing a glycosuria.

Anesthetics.—The anesthetics, ether and chloroform, are capable of producing a glycosuria. In etherization the hyperglycemia increases according to the degree of etherization and may be prevented by insulin. Insulin if given some time in advance of an anesthetic will prevent this hyperglycemia in smaller dosage than is required to clear up a hyperglycemia once established. The indication in diabetics undergoing anesthetization is clear.

DIABETES MELLITUS

In the light of our present knowledge diabetes mellitus may be defined as a persistent abnormality of the carbohydrate metabolism caused by a diminished function of the islands of Langerhans of the pancreas, characterized by inability of the body to store and utilize glucose, resulting in a hyperglycemia with or without glycosuria.

The pathology commonly associated with diabetes is a hyaline degeneration and atrophy of the islands of Langerhans. The kidneys show at times a peculiar hyaline degeneration in the epithelium of the straight tubules which Ehrlich proved consisted of glycogen deposits. The liver commonly contains less than the normal amount of glycogen, depending on the severity of the disease. This failure on the part of the liver and muscles to store glycogen and the failure of the tissues to utilize glucose are the two outstanding characteristics of diabetes.

In diabetes the normal conversion of glycogen to glucose and of lactic acid to glucose persists, but the normally reversible character of these reactions, that is, the glucose to glycogen and glucose to lactic acid, is interfered with. Just why the glucose molecule is not utilized is not known. The defect lies apparently somewhere in the process of the conversion of glucose to lactic acid and therefore is not an oxidative defect. Shaffer thinks it likely that there is a failure of conversion of the alpha and beta glucose to the gamma form, the forms differing in their optical rotation. In diabetes the blood sugar does not show the low optical rotation found normally. Insulin corrects this.

It is known that the burning of fat in the body is dependent on the burning of sugar. Acetoacetic acid must combine with a product of the oxidation of glucose before it can be itself oxidized. There is some evidence that the acidosis in diabetes may be sufficient to prevent the normal rotation changes of the blood sugar and further prevent glucose utilization. However, attributing failure in the utilization of glucose to acidosis is putting the cart before the horse.

The discovery of insulin has been of assistance in throwing light upon some of the problems associated with carbohydrate metabolism. Insulin raises the respiratory quotient, lowers the blood sugar and increases the glycogen content of the liver. It seems to act quantitatively and will lower the blood sugar in a normal as well as a diabetic. It may produce a profound and prolonged fall in blood sugar if no glycogen is available, while the reaction may be transient if glycogen is available. The application to the treatment of severe diabetes with little available glycogen is apparent. Insulin shock will occur experimentally whether the liver has been removed or not—an indication that tissue utilization rather than liver storage is mainly responsible for the lowering of blood sugar.

Von Noorden has stated that the acute infections such as angina, influenza, measles and scarlet fever have an etiological bearing.

Joslin found a family or hereditary history in 21 per cent of his cases and obesity present in 40 per cent. He has recently expressed the opinion that the high incidence of diabetes in the Jewish race is due to obesity rather than nationality. Beeler and Fitz investigated the carbohydrate tolerance in individuals overweight in an effort to show them prediabetics. Their results were disappointing in that the blood sugar curves were nearly normal in the majority of cases. No prediabetic tendency in fat individuals as a whole was proven.

Arteriosclerosis is frequently associated with diabetes. It is commonly of the senile type and Joslin calls attention to the absence of arteriosclerosis in the severe acute forms under fifty years of age. In elderly individuals the relation of the arterial change to the diabetes is much the same as its relation to nephritis. Sometimes it seems the cause and at other times the effect.

The structural change commonly found in the pancreas in diabetes suggests a previous pancreatitis and yet very rarely can the diagnosis or even a

suggestive history of a pancreatitis be associated with a diabetes. On the contrary according to Garrod glycosuria is rare in a grave pancreatitis. He cites a case reported in 1909 by Barberi of a boy six years old who six days after the development of mumps experienced a severe epigastric pain, presumably due to a pancreatitis, which was followed by a temporary glycosuria. Von Noorden is of the opinion that a lowered tolerance in febrile conditions is due to toxic action on the pancreas.

The intimate association anatomically of the biliary system and the pancreas suggests a causal relation. An occasional instance has been reported of temporary glycosuria following a catarrhal jaundice. Lichty, in a review of 23,464 patients, found 1,474 with gallbladder and duct disease, in only six of which was the existence of both diabetes and biliary tract disease verified. In three of these six cases the diabetes apparently was cured following operation for cholecystitis. It is well to bear in mind then the possible though rare etiological relation between the two diseases.

GLUCOSE TOLERANCE TESTS

In the interpretation of the commonly used glucose tolerance test it must be recognized that the motility of the stomach and intestinal absorption is a very variable factor. Fitz and his co-workers recovered 22 to 68 per cent of the ingested glucose from the duodenum and stomach by means of the tube one hour from the time of ingestion.

In an effort to obviate this variable factor Woodyatt, and Wilder and Sansum tested the carbohydrate tolerance by the introduction of glucose solutions intravenously. They concluded that sugar is normally utilized when it is given at the rate of about .8 gram per kilo body weight per hour. Above this rate glycosuria occurred, indicating that the limit of tolerance had been surpassed. In diabetics tested, glycosuria occurred before this rate was reached. In five cases of exophthalmic goiter a reduction in tolerance was also found. Normal assimilation was determined by Wilder and Sansum in one case of hypothyroidism, two of acromegaly, one of gigantism and two of dyspituitarism. They suggested that a delayed intestinal absorption in these last mentioned conditions accounted for the apparent high tolerance reported by others using the oral route.

Rigler and Ulrich have reported a technic which

consists of the intravenous injection of a sterile 20 per cent solution of glucose in such amount that .33 grams of glucose per kilo body weight is administered in ten minutes. Fasting blood sugar and determinations 5, 30, 60 and 120 minutes after the injections are made. The cases so far reported indicate that this method gives accurate information regarding glucose tolerance, the variable factor of gastro-intestinal absorption being eliminated. A sufficient number of cases have not as yet been reported for the establishment of standards.

Several objections may be raised to the above mentioned intravenous technics. Intravenous injections carry with them certain hazards and are rather complicated. The nervous effect on the blood sugar must be enhanced. The delay of the glucose in reaching the liver, however, is not a variable quantity and is no objection to these methods.

The test most commonly used and therefore the best standardized is the one described by Hamman and Hirschman in which 100 grams of glucose is administered in 500 c.c. of lemonade after an overnight fast. The blood sugar and urine are tested before the glucose is taken and in one-half, one, two and three hours. The remarkable accuracy of the Lewis and Benedict technic for blood sugar determinations recommends it for general use although there is only slight variation in the figures reported with the different technics. The desirability of a uniform technic should be emphasized.

The normal fasting blood sugar varies in different individuals. Joslin places it between .06 and .11 per cent, using the Lewis and Benedict technic. Reports by various authors place it between .04 and .12 per cent. Gray collected the reports on 431 normals and found the average fasting blood sugar .09 per cent with .10 per cent the most common.

In 300 normal cases collected by Gray the average blood sugar curve after 70 to 100 grams of glucose according to the above mentioned technic ran .09, .14, .12, .11, and .09. (See chart.) The normal variation was considerable, maximal figures reading .16, .23, .28, .26, .17. The above mentioned average curve may be taken as typical. It is interesting to note that 41 per cent of the three hour readings in these 300 normal cases were above the average figure .09 per cent.

In 129 normal individuals Gray found that 40 per cent developed a glycosuria after ingesting 100 grams of glucose and thinks the percentage would have been even higher had more specimens been tested. This is an interesting observation in view of the statement made by von Noorden in 1905 that the normal individual tolerates 150 to 200 grams of glucose without showing a glycosuria. The more delicate reagents now in use, Benedict's in particular, may account for this lack of agreement.

The most important blood sugar readings are the fasting and the half hour reading after the ingestion of the glucose inasmuch as the maximum figure is generally reached in a half hour in normals. Hamman and Hirschman, however, consider the duration of the curve of more significance than the height.

Our conception of kidney threshold for sugar has been recently somewhat modified by the demonstration of sugar in the urine normally to the amount of about one gram in the twenty-four hours. The amount, according to Bailey, varies with the blood sugar. Benedict has coined the term glycuressis to designate sugar in the urine above the physiologic amount and he considers glycuressis a normal kidney function.

In diabetes the blood sugar curve shows certain variations depending on the severity of the case. In the severe or moderately severe cases the fasting blood sugar is above the .11 usually considered the upper normal limit and the curve runs much above the normal throughout.

In mild diabetes, however, the interpretation of the blood sugar curve may not be conclusive. Gray collected 131 cases of uncomplicated diabetes forty of which showed a fasting blood sugar of .11 or under. The average blood sugar curve of these forty cases was .09, .16, .20, .15, .10. (See chart.)

It may be concluded then that a mild diabetic shows on the average a blood sugar on the half hour and hour distinctly higher than the normal with the additional characteristic that the hour reading is higher than the half hour. The average curve in mild diabetes shows also a delayed return to the fasting point, the two hour reading being distinctly high. In this series of mild diabetics mentioned it should be noted that the average three hour reading was nearly the average starting point. In mild diabetes then the three hour reading is

not enough higher than the fasting blood to be significant.

Emphasis must be laid on the fact that the individual curves which go to make up these average curves which are taken as typical, vary widely. Curves vary with the absorption and this factor is decidedly variable. Each laboratory should establish normal standards with its particular technic for comparison.

While a tolerance test in which the oral administration of glucose is used may be of assistance in making a diagnosis, a diagnosis based on the blood sugar curve alone is not justifiable.

Reports of the blood sugar curve after 100 grams of glucose in cases of nephritis show in some instances a typical diabetic curve. Hopkins reports that three of four cases tested showed a marked hyperglycemia with a sustained peak and slow fall. Hamman and Hirschman find this same

renal threshold is often raised for some unknown reason. This accounts for the rather common experience of an improvement in the glycosuria with the development of a nephritis complicating a diabetes.

The following case is illustrative:

Mrs. M. J. J., aged 67, colored, was admitted to the Ancker hospital in April, 1924. She presented the typical picture of cardio-renal disease with orthopnea and generalized edema. The blood pressure was 210/80, pulse 70 to 80. The urine ranged in specific gravity from 1014 to 1026 and was loaded with albumen and hyaline casts. No sugar was present on repeated examination. The blood sugar was .22, .25, and .21 per cent on three different occasions.

Her hospital chart of a former admission to the same hospital five years before showed that she had had at that time a persistent glycosuria and the usual subjective symptoms of diabetes. An infection of her foot which took two or three years to heal was also present.

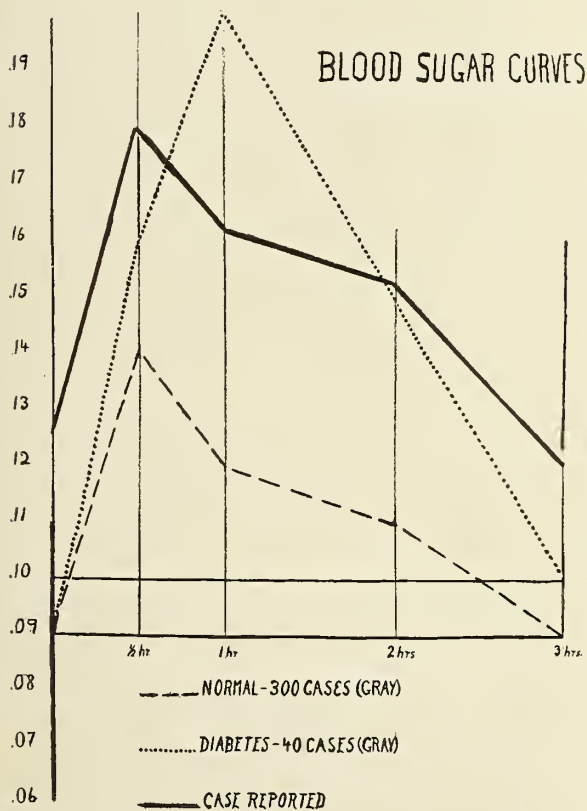
This patient was too ill to permit a glucose tolerance test. She undoubtedly had had diabetes and the presence of a nephritis accounted for the high threshold. The persistent hyperglycemia shows that the diabetes was still present. The diagnosis of diabetes might well have been overlooked in this case had the previous hospital record been lacking. While a deficient kidney might account for a delay in the return of a hyperglycemia to the fasting level it could scarcely account for a fasting blood sugar higher than the normal. It seems likely that some at least of the cases of nephritis which have been reported with a fasting blood sugar higher than normal are instances of both diabetes and nephritis.

RENAL GLYCOSURIA

The existence of a persistent glycosuria due to increased permeability of the kidney to glucose, or in other words due to a lowered renal threshold, has only recently been established. As late as 1912 von Noorden refused to recognize the condition. With the development of routine blood sugar estimations numerous authentic cases have been reported.

In 1896 Klemperer reported a case and stipulated that to justify such a diagnosis the glycosuria must be independent of food carbohydrate and the blood sugar normal.

Luthji in 1901 believed a coexistence of a nephritis was a requisite. Since then it has been shown that a nephritis often raises rather than lowers the renal threshold for sugar.



reaction in some of their nine cases and attributed the absence or only slight amount of sugar excreted with the hyperglycemia, to deficient kidney function. In nephritis complicating diabetes the

In the diagnosis of a renal glycosuria Strause offered the following postulates: (1) a glycosuria without hyperglycemia; (2) glycosuria more or less independent of carbohydrate intake; (3) absence of diabetic symptoms; (4) no subsequent development of diabetes. Paullin added (5) sugar constantly present in the urine.

Graham has described two types of renal glycosuria, one in which less than 10 grams of sugar are passed in twenty-four hours and the other in which 10 to 30 grams are passed. He at first laid down two postulates: (1) that the blood sugar must be within normal limits, and (2) that sugar must always be present in the urine. Later he described a third type of renal glycosuria in which the fasting blood sugar and blood sugar curve are within normal limits but where glycosuria occurs only after a carbohydrate meal.

This third type includes the individuals who are so difficult to classify. They have none of the subjective symptoms of diabetes, the blood sugar is within normal limits and glycuressis occurs only when the physiological alimentary hyperglycemia within normal bounds rises in excess of a renal threshold lower than the average. Close scrutiny of a blood sugar curve is necessary to detect what accounts for the glycuressis; whether the abnormality is due to a poor handling of the carbohydrate suggesting diabetes or whether a threshold lower than average accounts for the glycuressis.

The following borderline case is briefly submitted:

W. M., aged 37, physician, was refused life insurance in January, 1924, because sugar was detected in the urine. He had never had any subjective symptoms of diabetes.

A paternal uncle had died of diabetes at the age of 62. His father was suffering from pernicious anemia at the time and several years ago had shown sugar in the urine although not in recent years. He is a hearty eater and fond of carbohydrate food; a heavy smoker, he uses alcoholic beverages only occasionally.

In childhood he suffered from the usual contagious diseases, which included mumps, scarlet fever and measles. In 1919 he suffered from a mild attack of influenza.

One peculiarity which he has noticed since childhood is the tendency to flush very easily, sometimes on apparently no provocation.

Examination showed a well built male, 5 feet 10 inches in height weighing 202 pounds. His weight was well carried. Pulse, temperature and blood pressure were normal and there was no indication of arteriosclerosis. The hair was prematurely gray-streaked, this being a family characteristic, his father and mother both having become gray in middle life. A slight arcus senilis was apparent.

The urine passed in the early afternoon showed a trace of sugar (.5 per cent on fermentation) and no albumen.

On repeated examination of specimens passed in the morning no sugar was ever detected. One hour after an ordinary meal at noon consisting of meat, potato, a slice of bread, coffee with sugar and a piece of pie, a fraction of a per cent of sugar was repeatedly detected in the urine.

A tolerance test using 100 grams of glucose after an over night fast showed a blood sugar curve of .126, .180, .162, .153, .120 with 1.5 and 1.7 per cent sugar in the urine one and two hours respectively after the ingestion of the glucose. (See chart.) Sugar appeared when blood sugar ranged from .180 to .162 and on the down curve between .162 and .153 per cent.

Moderate dieting reduced this patient's weight from 202 to 180 pounds and the sugar failed to appear after a noon meal which previously produced it.

The possibility of an abnormally sensitive sympathetic system being responsible for the glycosuria in this case was considered but ruled out on the lack of relation between the sympathetic manifestations and the glycosuria.

The blood sugar curve is within the normal limits established at the laboratory where the test was carried out, although the fasting blood sugar and the curve as a whole are higher than the average of curves elsewhere reported. The two hour reading of .153 per cent is rather high but the return to the fasting level occurred in three hours. Glycosuria present when the blood sugar ranged between .162 and .153 on the down curve does not necessarily indicate a low kidney threshold as glycosuria has been found to occur at a somewhat lower level on the down curve in these tests than on the up curve.

Here, then, is an individual showing a glycosuria only after an ordinary carbohydrate meal, where apparently the alimentary hyperglycemia surpasses a renal threshold which is normal or possibly slightly below the average. The individual is overweight and there is a family history of diabetes.

A positive diagnosis in such a case as the one cited is not possible. The failure to demonstrate a definite lowering of the renal threshold for sugar does not permit a definite diagnosis of renal glycosuria. The glycosuria following an ordinary carbohydrate meal certainly indicates a lowered tolerance and in the absence of any abnormalities which might affect carbohydrate tolerance suggests a mild diabetes. The indication for treatment is very definite. The diet should be reduced in carbohydrate sufficient to control the glycosuria and

overweight should be avoided. This treatment has so far remedied the situation in this case.

The future course of this patient may clear up the diagnosis. Not necessarily, however. If our conception of diabetes is correct a little care in the diet may well prevent the development of a frank diabetes and the diagnosis ten years from now may be just as uncertain as at present.

It has been my purpose to show that carbohydrate metabolism is a complicated affair and subject to a regulation by a delicate balance of numerous factors. The interpretation of glycosuria depends on a careful consideration of the clinical picture presented by the individual.

SUMMARY

While a diabetes of purely nervous origin does not exist a temporary hyperglycemia and glycosuria may result from nervous stimulation of the adrenal and consequent glycogenolysis.

Glycosuria is frequently associated with dysthyroidism and dyspituitarism.

There is probably a causal relation between the hypertrophy of the pituitary and the frequent presence of glucose in the urine in pregnancy.

Renal glycosuria probably exists where there is only slight lowering of the renal threshold for sugar and where the glucose appears in the urine only accompanying a normal postprandial hyperglycemia.

The usual glucose tolerance test is quite inaccurate because of individual variation in gastrointestinal motility and absorption.

An appreciable percentage of normal individuals show a glycosuria following the ingestion of 70 to 100 grams of glucose.

Blood sugar values in the glucose tolerance test commonly employed show marked variations in the normal.

Pronounced cases of diabetes or renal glycosuria may be readily differentiated by the usual glucose tolerance test.

A blood sugar curve within normal limits does not exclude a *mild* diabetes.

We have no method of absolutely differentiating mild diabetes from renal glycosuria with only slight lowering of the renal threshold for sugar.

The term prediabetic or potential diabetic is justified in describing the borderline cases not shown to be definitely renal glycosuria. Dietary restriction in these cases will control the glycosuria and is definitely indicated.

Glycosuria may rarely result from gallbladder infection and resultant injury to the pancreas.

It is likely that a certain number of diabetics with accompanying nephritis and resultant elevated kidney thresholds for sugar are overlooked.

While we do not know the cause of diabetes there is evidence to show that overstimulation of the islands of Langerhans by excess of carbohydrate ingestion may be a causal factor in an individual whose pancreas is below par either congenitally or as a result of infection.

Our hope of preventing diabetes lies in the prevention of acute infections, the control of overweight and the early detection of glycosuria.

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DISCUSSION

DR. ULRICH: Dr. Drake mentioned some work Dr. Rigler and I did on this subject. We were trying to standardize the blood sugar curve. We called attention to the fact that the "glucose tolerance test" is not a good term. We called it blood sugar reaction following the injection of glucose. We tried to get some sort of a quick, accurate method to determine this curve. At the present time that work has not been finished.

This thesis covers quite a tremendous territory. It includes not only glycosuria, but glycemia and diabetes.

I have taken the blood sugar on every patient who is given a thorough examination in my office, and find a large percentage of these have hyperglycemia. These people are not diabetics. All diabetics are ruled out. They come with all sorts of symptoms, particularly complaining of vague pain. They improve on mild dietary measures.

DR. SCHLUTZ: The peculiar greenish-yellow color given by some urines, if tested with Benedict's reagent, is probably due to pentoses. Patients on a diet consisting largely of vegetables often give this reaction.

Prof. Folin, in a recent article on carbohydrate tolerance, mentions the effect of excitement upon blood sugar and finds that it easily causes an increase. We are now carrying out some experimental work along similar lines in children, but so far have not observed this influence. It is possible that the psychic reactions of the child may not be as sensitive or profound as those of the adult.

DR. FREEMAN: I would like to mention a very simple and accurate test for sugar in urine that Dr. Eduard Boeckmann showed me about twenty years ago. An ordinary test tube is filled three-quarters full with the urine to be examined. About 5 c.c. of a saturated solution of sodium hydrate is added. The thumb is placed over the opening and the test tube is inverted so as to mix the liquids. The upper part of the column of the fluid is then gradually heated over a Bunsen burner. In positive cases a chocolate-brown color appears at the top in the heated area of fluid.

DR. GILFILLAN: My understanding was that theses were not discussed. The paper is very interesting and I think one of the things to be learned is that we have no absolute test for diabetes. In the case mentioned by Dr. Drake, of a physician who had glycosuria and somewhat doubtful blood sugar curve, I don't think we can tell whether or not he has diabetes.

I think renal glycosuria is not so uncommon as we used to think. I see cases now who pass sugar on a blood sugar of 0.12 or 0.13, but that is not diabetes. Then there are cases we see with high blood sugar who do not pass sugar. I don't think that is diabetes. They are utilizing sugar; they are running a high blood sugar, but they are using all the sugar or it would accumulate.

Then there is the relation of that to some other diseases; for instance, the relation of high blood sugar to furunculosis, cataract and some other eye diseases. In many of those cases high blood sugar is found, but not diabetes.

Of course, in diabetes the effect of hyperglycemia itself is somewhat doubtful. The hyperglycemia itself does not

produce serious direct manifestations of diabetes. All of the efforts made to differentiate true diabetes from those conditions has led to no results so far. Ordinarily, diabetes is a progressive disease. I should say, in the case reported, if in ten years we found that curve the same, we could not say he had diabetes. If it progresses, it is diabetes, but if it stays the same we can not tell.

I don't think, in renal glycosuria, that the glycosuria is independent of diet, either. Some may have a threshold of 1.1 or of 1.5; the latter would secrete sugar possibly with ingestion of carbohydrate and the other without the ingestion of carbohydrates. We see a great variation in the threshold both in diabetes and in health.

In the case described, the curve shows slow utilization of sugar in the body, but the sugar is utilized, so it is not diabetes so far as we can tell.

DR. HALL: I think this is a very important paper. We very frequently see cases in which the urine shows a small amount of sugar at times only, with a blood sugar about the borderline. It is difficult to know how to classify these cases. The metabolism of sugar is an intricate process which is influenced by so many factors. Insulin appears to affect the metabolism of sugar from whatever cause, but we know very little as to how insulin really brings this about. In the presence of an infection it certainly is not nearly as efficient as in other diabetics.

There appears to be some evidence that inefficient Islands of Langerhans may improve. In one case cited by Dr. Drake, the man's organism apparently handled a diet normally which had formerly produced glycosuria. We see this very frequently in dieting diabetics. After they have been dieted for a time they take care of an amount of carbohydrates which they were previously unable to handle. In the early part of this year the Banting group obtained an autopsy, in a few hours after death, on a child who had been killed in a street accident. This child was one of their first insulin cases. At autopsy they thought they found evidence of regeneration in the Islands of Langerhans. This is an interesting observation.

There is no way to be sure how we should class such a case as Dr. Drake cites. I do not believe the glucose test is of great value. I think it best to consider him a potential diabetic.

DR. DRAKE (in closing): The last case I reported led me to investigate this subject. Dr. Gilfillan had seen the case and felt it was not diabetes, and another internist said it was. I did not know, so I started investigating, and when I got through I had to come to the conclusion that still I did not know.

If we can follow Joslin, this is the type of case we can hope to do something with, in the prevention of diabetes. If it is overworking the Islands of Langerhans that has to do with the causation of diabetes, then regulating the diet and keeping down overweight is the most we can do in the way of prevention.

IRREGULARITIES OF RESPIRATION*

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HISTORICAL

Irregularities of respiration have been noted from time to time by various authors. Aducco¹, by animal experimentation, found that complete paralysis of the entire respiratory apparatus, with the exception of the diaphragm, was made possible by the production of diffuse embolism of brain and bulb. Under these conditions the diaphragm alone was insufficient for the needs of the dog, so that artificial respiration was required. The diaphragmatic contractions could be arrested by stimulation of the crural nerve, probably through an inhibitory center.

Jackson² reported a pneumonia case in which the intercostal muscles remained inactive unless the patient was given a command to breathe. As the patient recovered, the intercostals again functioned normally. Jackson thought that the condition might be the result of a limited myelitis in the thoracic region of the cord.

Micheleau³ reported a case of tuberculosis in which each inspiratory movement was accompanied by a lowering of the larynx with substernal retractions and marked depression of the seven last intercostal spaces, while the abdominal organs were pushed aside by the diaphragm. At autopsy it was found that the two layers of the pleura were adherent at the level of the diaphragm and the lower part of the thorax.

Grocco⁴ described a type of respiration characterized by a more or less marked dissociation of contraction of diaphragm and of intercostal muscles, to such a degree that while the expiratory phase of the former was in progress, the beginning of the inspiratory phase of the latter occurred, or vice versa. Grocco thought that the term ataxic could be applied, since physiological co-ordination was profoundly disturbed. The dissociation was sometimes transient and sometimes of long duration, and usually indicated a serious prognosis. This type of respiration was observed in meningitis, cerebral tumor, cerebral abscess, cerebral hemorrhage, typhus fever, pneumonia, uremia, and occasionally in cardiac disease.

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Frugoni⁵ observed dissociated respiration in a woman during operative chloroform narcosis. There developed at first an irregular respiration, then dissociated respiration for several minutes, and finally a complete apnea. The condition was removed only by suspension of the operative intervention, and the administration of artificial respiration. This indicated a functional disorder of the bulbar centers.

Frugoni⁶ recorded respiratory movements by means of two Marey pneumographs, one at the level of the manubrium and one on the abdomen, in a fatal case of meningitis. The diaphragm was active, but the thorax was completely paralyzed, being moved passively to a slight extent.

The same author⁷ published a record in which a rhythmic diaphragmatic respiration was accompanied by an arrhythmic costal respiration. This record shows a few respirations of the sighing type, in which the diaphragm and the intercostals acted together. In all the other respirations there was dissociation, in which the diaphragmatic inspiration was accompanied by intercostal expiration. In Graph VII, page 463, a persistent arrhythmia is shown, with a tendency to periodicity. The excursions of the left thorax were greater than those of the right thorax. The same condition is emphasized in Graph 8, page 464, which shows tracings taken from the epigastrium, and from the left and right second intercostal spaces. A brief history is given, stating that the patient was a heavy drinker, and had suffered from spasms of the larynx for two years. At times there was shortness of breath, dyspnea, cramps of the extremities, epigastric pain and eructations. The dissociation of respiration disappeared during sleep and was accentuated during the waking hours by cold, fatigue and emotional states. Frugoni made records of the type of respiration described by Grocco, and agrees with the latter in the seriousness of prognosis. He realized that morphine may exaggerate a Cheyne-Stokes type of respiration or initiate a periodic type.

Conner⁸ recorded respirations, using two Marey pneumographs, one about the thorax at the level of the third rib, and the other about the abdomen, midway between the ensiform and the umbilicus. The type occurring often in meningitis showed periods of apnea, varying in length, and occurring at irregular intervals. He observed a constant irregularity in rhythm, and in the force of the indi-

vidual respirations in such cases, and thought that it might be due to an involvement of the root of the glossopharyngeal nerve in the inflammatory process.

Warren⁹ studied a case of bronchial asthma, in which the diaphragm moved but slightly, and the normal order was reversed. He thought it possible that the excessive thoracic movements exerted a pull on the diaphragmatic attachments, giving the impression that intercostal inspiration was accompanied by diaphragmatic expiration.

Coleman¹⁰ stated that he has observed asynchronism in many severe cases of lobar pneumonia during the past twenty years. In this type, there is a separation of the contractions of the diaphragm and intercostal muscles by a definite, but variable, time interval. In well developed cases, the abdominal wall reaches the expiratory phase before the intercostals begin to contract. Asynchronism was noted by him only in cases of lobar pneumonia, and indicated a serious prognosis.

The same author¹¹ again described asynchronism, and suggested possible causes for the condition.

Hoover¹² attacked Coleman, stating that the movements of the thorax so described indicate an enlarged heart. Coleman¹³ defended his position, showing records of the type he had formerly described. In the type described by Hoover there was no asynchronism. The muscles all contracted together, but the sternum was depressed during inspiration, owing to a distortion of the thoracic cage. No delay occurred.

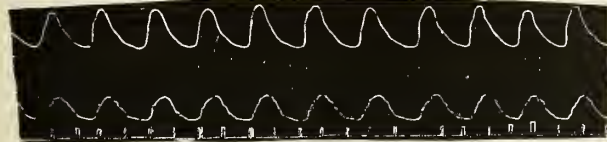
EXPERIMENTAL

Interest in this subject was aroused by the Coleman-Hoover controversy. Dr. Henry L. Ulrich suggested that observations be made in the wards of the Minneapolis General Hospital, and he later made the necessary arrangements. The method employed was extremely simple. Two rubber bags (from sphygmomanometers) were fitted into muslin covers, to which was attached a long strip of muslin which could be wound about the patient's body two or three times. One tube of each bag was attached to a bulb as in blood pressure determinations. The second tube of each bag was attached to a tambour by means of pressure tubing. The movements of the tambour levers were recorded on a smoked surface, the upstroke indicating inspiration, the downstroke expiration. One bag was placed about the thorax as high as possible under the arms, the other about the abdomen over

the umbilicus. Thus the upper tambour recorded intercostal activity and the lower diaphragmatic activity. The time in seconds was recorded by means of a metronome and signal magnet. The apparatus was placed on a small table which could be wheeled to the bedside so the patient was not disturbed by the record-taking. The records should be taken without the influence of conscious efforts on the part of the patient. The patients appeared to enjoy having records taken and practically no objections were encountered at any time, hence we believe that the method is applicable to routine clinical procedure.

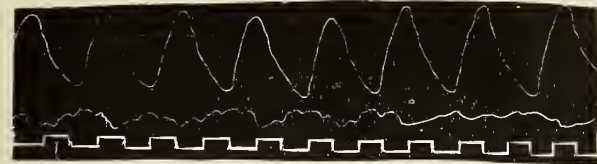
RESULTS

Many types of pathological cases were studied together with a large number of normal cases. In analyzing the tracings, especial attention was paid to the time relations. In all cases of normal breathing the time periods of the intercostal and the diaphragmatic contractions were the same. In many cases of pathological breathing, we found variations in the time relations. The tracings furnish information regarding time, rate, and sequence, as do venograms and arteriograms.

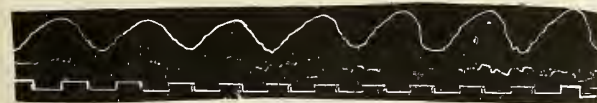


Tracing I

Tracing I shows the respiratory movements in a normal subject.



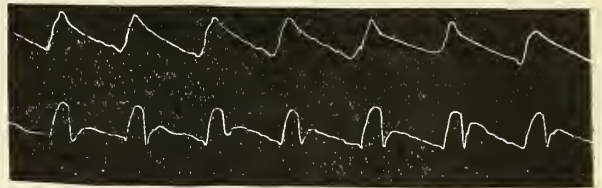
Tracing II



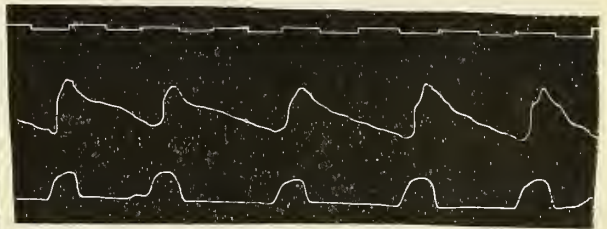
Tracing III

Tracings II and III were taken from a boy, 17 years old, with chronic adhesive pericarditis. The thoracic respirations are much deeper than the diaphragmatic in both cases. When Tracing III was taken the patient was lying back on the pil-

lows, so the respiratory movements are less extensive than in Tracing II, during which the patient was sitting up. These records are interesting because the diaphragm was observed to move very slightly when the patient was placed under the fluoroscope. It was encouraging to have a means of checking the impression gained from the respiratory records, that owing to the adhesions the diaphragmatic excursions were greatly decreased. The time relations were normal. The rate in II was 20 per minute, and in III, 22 per minute. There was pain in the precordium which became worse on deep inspiration.

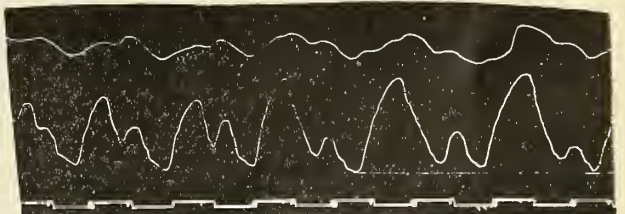


Tracing IV



Tracing V

Tracings IV and V were taken from an 18-year-old girl suffering from asthma. Both records show a decided thoracic expiratory prolongation. In Tracing IV the abdominal record suggests that the diaphragm attempts a second contraction during the prolonged thoracic expiration (rate 18 per min.). This attempt is absent in Tracing V, in which the rate was 21 per min.

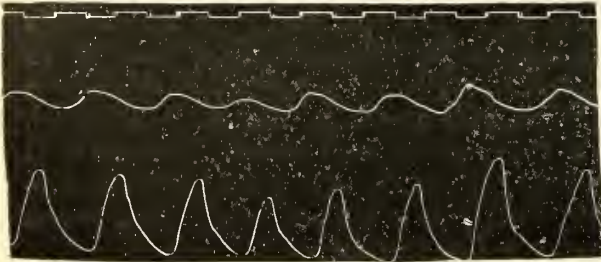


Tracing VI

Tracings VI and VII were taken from a man about 28 years of age, who was diagnosed as a case of lethargic encephalitis. Tracing VI shows a peculiar type of respiration, in which the tho-

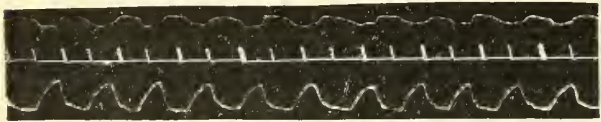
racic is poorly developed, and the abdominal shows a tendency toward a second inspiratory effort during expiration, resembling in appearance the dicrotic notch of a radial pulse tracing (rate 38

per min.). Tracing VII was taken one month later. The thoracic movements are fairly regular and the tendency to the secondary inspiratory effort during the diaphragmatic expiration is less marked. The rate was 32 per minute.

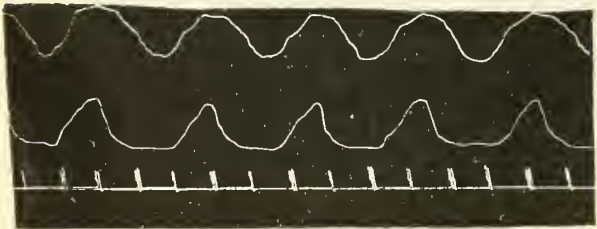


Tracing VII

per min.). Tracing VII was taken one month later. The thoracic movements are fairly regular and the tendency to the secondary inspiratory effort during the diaphragmatic expiration is less marked. The rate was 32 per minute.



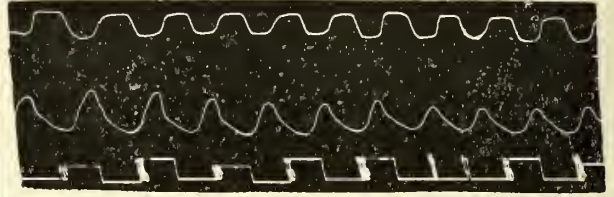
Tracing VIII



Tracing IX

Tracings VIII and IX were taken from a nurse in training, about 20 years of age. Her case was first diagnosed as pneumonia and her respirations were noted from day to day. In Tracing VIII, asynchronism may be noted. As the diaphragm is just beginning to relax, the intercostals are beginning to contract. This was considered serious and a more thorough examination revealed a marked pleural effusion. After this was withdrawn, the patient began to improve. The rate was 30 per minute. Tracing IX was taken four weeks later and it shows that asynchronism has disappeared and the rate was 22 per minute.

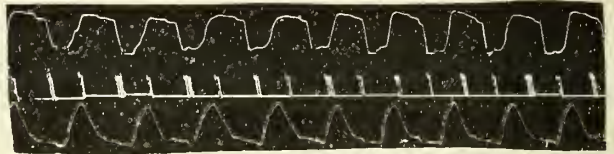
Tracing X was taken from a man 43 years old with a diagnosis of influenza. The patient died,



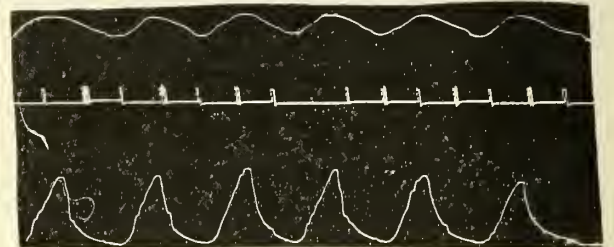
Tracing X

mains in an inspiratory position, relaxing just before the next diaphragmatic contraction ensues. The patient had used morphine for fifteen years, and was receiving it frequently in the hospital. The rate was 33 per minute.

Tracings XI and XII were taken from a man 56 years old with a diagnosis of lobar pneumonia.



Tracing XI

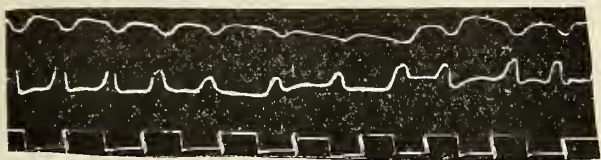


Tracing XII

It will be noted in Tracing XI that there is a prolonged inspiratory effort of the intercostals while the diaphragm is relaxing. The inspirations begin together, but the diaphragmatic is much shorter. This is not asynchronism. Rate 30 per minute. In Tracing XII, taken one month later, the respiratory movements are normal. Rate 18 per minute.

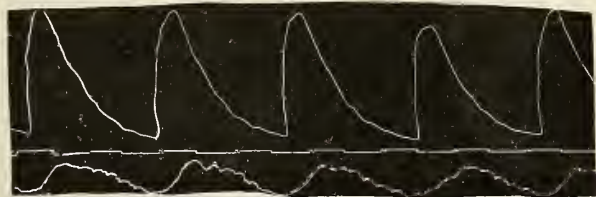
Tracing XIII was taken from a man 63 years of age, whose case was a puzzling one. When he first entered the hospital, there was no asynchronism in respiratory movements, but a prolonged expiratory phase was noted in both the thoracic and the abdominal respirations. Three days later asynchron-

ism was noted, and it was present until death, eight days later. Tracing XIII was taken fourteen hours before death. The movements are very shallow, and asynchronism is shown. By autopsy, diagnoses



Tracing XIII

of chronic bronchitis, broncho-pneumonia, pulmonary edema and empyema were made. Rate, 44 per minute.



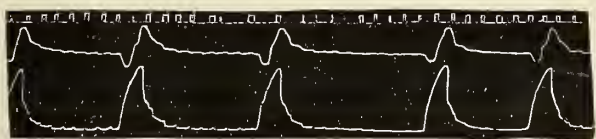
Tracing XIV

Tracing XIV was taken from a boy 18 years of age. His diagnosis was asthma. Prolonged expiration is noted. The thoracic movements are much greater than the diaphragmatic. Rate, 18 per minute.



Tracing XV

Tracing XV was taken from a man 40 years of age with lobar pneumonia. Asynchronism is noted, the thoracic inspiration beginning just as the diaphragmatic expiration begins. As thoracic expiration occurs, the diaphragmatic inspiration begins. This patient died within a few days. Rate, 30 per minute.



Tracing XVI

Tracing XVI was taken from a woman 36 years old. She was a morphine addict. She died shortly

after the record was taken, and her death was reported due to broncho-pneumonia. From this tracing it would seem rather to be due to morphine as the rate was extremely slow, being 8-9 per minute.

DISCUSSION

The cause of many of these irregularities remains obscure. Various suggestions have been made from time to time. Aducco,¹⁴ quoted by Luciani, recorded observations which he interpreted to indicate that expiratory centers exist apart from inspiratory centers. These centers may function independently, as shown by the injection of chloral hydrate. In some cases both inspiratory and expiratory centers of the thoracic muscles were thrown out of action, and likewise the inspiratory center of the diaphragm, the expiratory center alone remaining active. In other cases, only the expiratory center for the thoracic muscles remained active, and since the abdominal movements were passive, asynchronism is evident in his records. The mechanism of the action was not understood.

Peabody¹⁵ states that infection is accompanied by a diminished carbon dioxide content of the venous blood during the febrile period. This relation holds in pneumonia, the lowest carbon dioxide content being associated with very rapid respiration. The same author¹⁶ found that in uncomplicated cases of lobar pneumonia the oxygen is within normal limits.

Henderson¹⁷ found that the threshold of the centers for carbon dioxide is raised more than the threshold for afferent nervous impulses by morphine.

Capps¹⁸ studied the pain sense in the pleural membranes. He found that the visceral pleura is not sensitive to pain. In the parietal pleura, the pain is accurately localized. It may be that afferent impulses are responsible for alterations in respiration through their effect on the centers.

Cushny¹⁹ studied the effects of drugs on respiration in decerebrate rabbits. The animals were so placed in a plethysmograph that movements of the thorax could be recorded. He found that 1 to 2 mg. of morphine given intravenously at intervals always slowed the rate of respiration. The response to inhalation of carbon dioxide was markedly reduced. By experiments on the afferent fibers, results were obtained which indicated that

the inhibitory impulses over the vagus were rendered more effective by morphine.

Barbour²⁰ finds periodic respiration after morphine, which he attributes to a depression of the respiratory center.

Means, Newburgh and Porter²¹ studied the condition of the respiratory mechanism in pneumonia. They used cats in their experiments and increasing the carbon dioxide in the inspired air, measured the increase in volume of tidal air in normal cats and in pneumonic cats. Their results are striking. The normal cats showed a marked increase in tidal air with increase in carbon dioxide, while the increase in the pneumonic cats was much less. They conclude that the reaction of the respiratory mechanism to carbon dioxide is greatly diminished in pneumonia.

Newburgh, Means and Porter²² repeated the above experiments, using dogs. As the disease advanced, the carbon dioxide reaction diminished. They found that section of the vagus nerves prevented the depression of the respiratory mechanism in pneumonia.

Porter and Newburgh²³ suggested causes for the exhaustion of the respiratory mechanism in pneumonia. It may be due to toxins produced by the bacteria, to toxins formed in the lungs, to lack of oxygen, to increase of carbon dioxide, or to impulses over the vagi. They favor the last view, since there is neither dyspnea nor hyperpnea in pneumonia after section of the vagi.

Coleman¹¹ realizes that there are two factors to be considered, the direct action of the toxin on the nerve cells, and the afferent impulses from the inflamed lung.

So far, the problem of irregular respiration is unsolved. It will require much experimental work. Undoubtedly, morphine may be a complicating factor in some pathological cases, and must be kept in mind.

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THE SURGERY OF HYPERTROPHIC PYLORIC STENOSIS*

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The term "congenital hypertrophic stenosis of the pylorus" is sufficiently descriptive to require but little explanation.

Historically, although described a century before by Armstrong, the condition first obtained general recognition following the reports of Hirschprung in 1888. In 1905 Ibrahim published his first monograph on the subject and in 1908 was able to collect reports of 400 cases. The publicity thus gained soon made possible an estimate of the frequency of the condition. In 1906 Heubner placed the incidence at .5 per cent and ten years later Hertz noted it as 2.7 per cent in a series of 2,275 infants under one year of age. As to sex, the occurrence has been variously estimated at two and three males to one female. (Sauer, Richter.)

The essential lesion is an hypertrophy and hyperplasia of the musculature of the pylorus, chiefly in its circular fibers. The pylorus appears grossly as a firm, spool-like mass almost cartilaginous in consistency and sharply demarcated from the stomach and duodenum. The mid-portion is white and almost avascular, but at the gastric and duodenal margins the circulation rapidly approaches the normal.

On axial section the pyloric mass is dense and uniform. The circular muscle fibers are increased in number and size, and friable as though undergoing some hyaline change.

The mucosa apparently persists at its normal growth rate and aligns itself in longitudinal folds which further obstruct the already constricted lumen. According to Strauss the degree of obstruction has little relation to the size of the tumor mass which he finds to be smaller in young infants than in those of eleven or twelve weeks.

The stomach is usually distended and its walls hypertrophic although the degree of hypertrophy is dependent upon the length of time during which it has been forced to combat the constriction at the pylorus.

The clinical syndrome developing upon this basis is that of pyloric obstruction with its ensuing

train of metabolic disturbances. While many careful observers are at variance as to the average time of appearance of symptoms, reports ranging from a few days to several weeks, all are agreed that directly following birth there is a free interval which gives no intimation of forthcoming events. Thus, when obstruction becomes established in an otherwise normal infant, vomiting commences and soon increases in severity and frequency, being usually explosive and projectile in character. Unlike the vomiting of toxic states, the desire for food is generally present and the attempts of the stomach to empty normally are soon manifested by marked peristaltic waves. Appearing a few days after vomiting is begun, these gastric waves may be taken as corroborative evidence of obstruction and have been experimentally demonstrated (Veeder, Clopton and Mills), but their size and severity are not at all proportionate to the degree of pyloric hypertrophy (Reiche, Sauer). At the time when peristalsis is most marked or shortly after vomiting (Wernstedt, Sauer, Hertz) the pyloric tumor lying deep in the right flank may often be palpated. By some (Richter, Scudder, Downes) it is found in nearly all cases and considerable time and effort are employed in determining its presence or absence, while most others experience some difficulty in palpating a full abdomen and place correspondingly little emphasis on this feature.

It is probable that complete closure of the lumen rarely if ever obtains and that some portion of the feedings passes onward into the intestine, the resulting stool being more scanty than normal. This finding of persistently small bile-stained mucous stools is of the greatest significance, as it at once gives information as to the location and the severity of the lesion. Further evidence may be gained by noting the time at which ingested food is vomited, by measurement of the aspirated content and by fluoroscopic examination.

As little of either fluid or solids is allowed to pass to where it may be absorbed, and as water absorption from the stomach itself is negligible, dehydration phenomena soon appear which if allowed to continue unrelieved result in appalling weight loss, athrepsia and finally exodus.

A further consideration of the points in diagnosis which serve to differentiate the condition from other more or less similar ones is too involved for the scope of this discussion. Let it suffice to say that diagnosis centers about the symptoms of in-

*Read before the Minneapolis Surgical Society, Feb. 5, 1925.

terference at the pylorus, and treatment upon the progress of the patient in overcoming it.

Continued vomiting, accompanied by visible gastric peristalsis and starvation stools, implies failure of the stomach to empty and, if not promptly and effectively relieved by other means, is an indication for surgery.

A strict adherence to this formula would doubtless bring some extreme cases of nonhypertrophic pylorospasm to operation and it seems not unreasonable that this should occur inasmuch as a spastic pylorus is as easily relieved by incision as is the purely hypertrophic constriction.

The amount of time which may be safely expended in observation or dietary treatment is variously estimated. Finkelstein and likewise Rammstedt allow two weeks' observation before resorting to surgery, while Drachter advises operation at the end of four or five days of unsuccessful treatment. Strauss, who reports the lowest surgical mortality, bases his determination chiefly upon the roentgenologic findings. While in his hands this is evidently adequate, most clinicians are governed by the increase or decrease in body weight. Although recovery has been reported following operation after 40 per cent weight loss (Guleke, Berend) any approach to the fatal Quest figure of 30 per cent makes the outcome extremely doubtful. Inspection of the normal infant weight curve makes it plain that a stationary weight is, in effect, a losing weight and as compared to the adult a persistent weight loss really proceeds by geometrical progression.

Because of the especial susceptibility of infants to dehydration (Mariott) restoration of tissue fluid and blood volume is the first consideration of preoperative treatment. In the milder cases, water by bowel, or subcutaneously, is sufficient if employed early and freely. In the severe and prolonged states of anhydremia, transfusion (via fontanelle) is necessary to replace the destroyed cells and serum protein (Keith). Because of the blood concentration following fluid loss, hemoglobin estimates made from the capillary blood are misleading and many cases that are given only water would be better off with blood transfusion. In fact it is probable that routine preoperative transfusion is advisable in all, and necessary in most, cases.

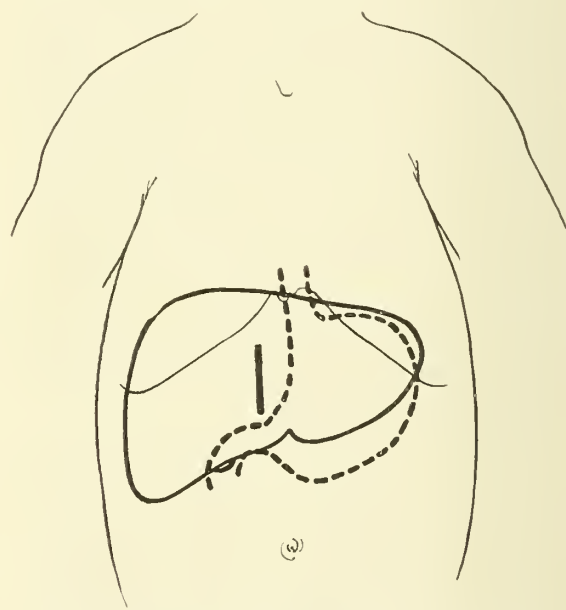
The use of sodium bicarbonate is unnecessary in the lesser degrees of anhydremia and is contraindicated in the advanced stages because of its effect

on further concentrating the blood and because of the alkalosis which usually occurs as a normal water balance is established (Mariott). For the same reasons the acidosis resulting from fluid loss is better overcome with glucose; this may be administered in 5 or 10 per cent solution not to exceed the limit placed by Woodyatt at 1 gm. per kilo per hour.

Any detailed discussion of types of operations is unnecessary. The divulsion method of Loretta is only of historical interest as is the Heineke-Miculicz pyloroplasty.

Gastroenterostomy, the operation of choice up to 1911, has been definitely discarded as unphysiological and dangerous. Today the generally accepted procedure is that of Rammstedt, either in its original form or as modified by Strauss.

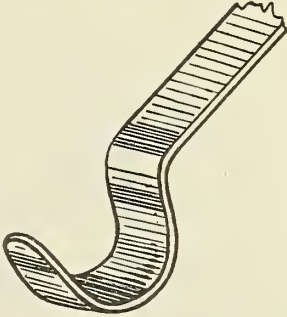
The actual surgical procedure should follow along some definite and well conceived plan. Careful timing will do much to avoid duplication of effort and unnecessary exposure of the patient.



(1) Diagrammatic topography of the infant abdomen showing the visceral relations and the position of the incision.

Preparation of surgeon and patient should be completed simultaneously and anesthesia begun just soon enough to allow uninterrupted progress of events. Ether, by the open method, I believe to be the anesthesia of choice for a variety of reasons, but chiefly because it allows the maximum of effort with the minimum of manipulation.

In determining the point and character of the incision the differing anatomical features of adult and new-born must be kept in mind. The cervical, thoracic and lumbar segments of the infant vertebral column occupy respectively one-fourth, one-half and one-fourth of its total length, while in the adult, growth has rearranged the limits to one-sixth



(2) Type of retractor employed to engage and hold the pylorus.

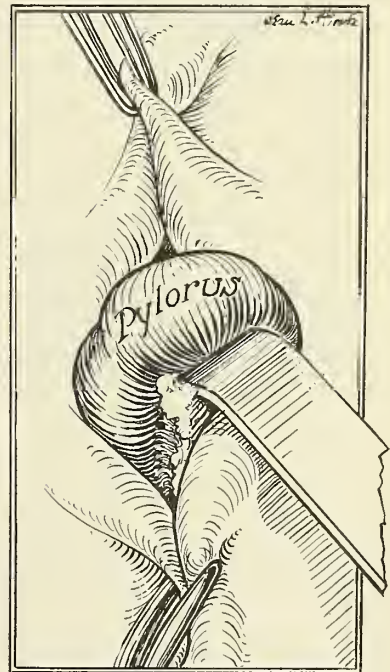
for the cervical one-half for the thoracic and one-third for the lumbar. Thus it will be seen that in the new-born the longitudinal measurement of the abdomen is relatively much shorter than in the adult. As a result the contained viscera lie lower than in later life. The liver of the well-nourished infant occupies about two-fifths of the abdominal cavity and, extending almost below the costal border, completely overlies the stomach.

The vertebral levels of pylorus and cardia are the same as at maturity but the short lumbar segment of infancy brings them lower and nearer the pelvic brim. In view of these structural relationships the most direct route to the pyloric lesion lies through the right rectus muscle just above the liver margin. This site is advantageous not alone for its ready accessibility but also for the action of the liver in preventing escape of intestine while opening and closing the abdomen and acting as a buffer for the closed wound. The poorly developed fascia and relatively thin abdominal musculature together with the slow healing in low nutritional states make the operative wound extremely liable to rupture. To combat this and also to shorten the time expended in closing, the incision should be as small as compatible with easy delivery of the pylorus. This length will usually not exceed 5 cm.

Once through the peritoneum the pylorus may be located with the tip of the exploring forefinger and brought to the surface with a narrow curved

retractor which is slipped alongside the finger after the manner suggested by Strauss. If delivery be found difficult because of short mesenteric attachments it may be aided by gentle traction on the falciform ligamentum. As infants do not tolerate evisceration, care should be taken that no intestine escapes or even is seen at the wound opening.

With the pylorus barely delivered and resting in the curve of the retractor, the pyloric tumor is incised longitudinally from stomach to duodenum, the deepest part of the incision being at the midportion and extending only part way to the mucosa. With a flat-bladed instrument the edges are separated and the deeper fibers are ruptured, the exposed mucosa bulging into the opening. Frequently some fibers remain intact and require cutting. This is particularly true near the duodenal end. To avoid accidental perforation I have employed a blunt ended double edged knife which cuts only laterally and which can be used with greater freedom than one with a sharp point. Strauss, in his modification of Rammstedt's technique, frees the



(3) Illustrating the manner in which the pylorus is held in position.

mucosa for nearly two-thirds of its circumference, claiming that the pyloric lumen is made larger at once, rather than gradually, and that for this reason his results are more positive and permanent. This, however, is not generally conceded and most

surgeons employ the original operation, which is certainly much simpler and probably quite as effective. As an incomplete operation is fatal to success in most cases, the incision of the muscle should be carefully inspected for constricting bands and when completed the mucosa should bulge freely into the wound throughout its length. The patency of the pylorus is usually made manifest by the gurgling escape of gas from the stomach into the intestine.

In some few cases there may be marked and annoying hemorrhage particularly in those where the tumor mass is not large or sharply defined. As it is chiefly venous and as no large vessels are to be encountered, hemostasis can usually be effected by a warm moist sponge; if not, a tag of omentum may be stitched to the serosa. Any attempt at placing deep sutures to control bleeding is useless, as the tissue is too friable to retain them.

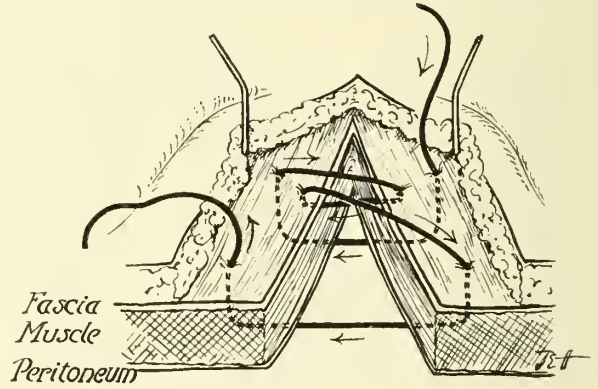


(4) Diagrammatic section of the hypertrophied pylorus illustrating the manner in which the duodenum may be accidentally opened. Below, bulging of the constricted mucosa after section of the muscle.

A not uncommon operative accident is perforation of the duodenal mucosa. The reason for this is usually an ill-advised attempt at cutting the deep muscular fibers which surround the pyloric orifice. The danger attendant upon this happening lies rather in the corrosive nature of the escaping duodenal fluid than in its bacterial content.

While the operative risk is obviously increased not only by the possibility of leakage but by the

added time necessary to repair the damage, this complication is not often a cause of death. Simple approximation of the mucosal wound and application of a covering of omentum is usually successful. In closing the abdominal wound it is well to remember that the infant places a much greater



(5) Diagrammatic illustration of a method of closing the abdominal wound.

strain upon the line of suture than does the adult and the incidence of ruptured wounds is correspondingly increased. This may be guarded against by using chromic gut throughout and by generous reinforcement with silkworm stay sutures.

The postoperative care of these cases is comparatively simple but must be exactly and scrupulously ordered.

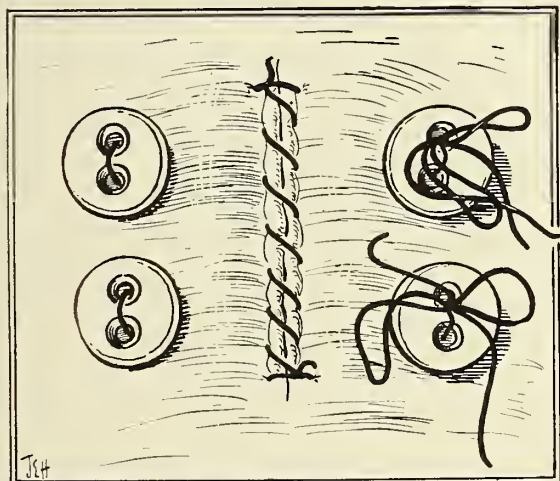
Three definite needs must be observed: food, water and rest. In planning the diet various schemes may be followed. Morgan, Goldbloom and Spence have published the details of management in the cases operated by Downes and other schemes equally good are available. All, however, must subscribe to the general rule that the infant must be returned to his normal diet in the shortest possible space of time. The prolonged practice of abnormally timed and modified dietaries is not only of no possible good but a source of actual damage to the patient.

What is frequently overlooked in infant surgery is disturbance to and loss of the usual periods of rest. This is probably due to the natural hesitancy in administering opiates to the very young. It has recently been demonstrated that babies tolerate opium best in the form of codein and that double and treble the usual doses may be administered with safety.

The end result in those cases surviving operation leaves little to be desired. Veeder, Clopton

and Mills, who made roentgenologic observations of children years after recovery, found gastric motility to be normal, and Reiche reported a series of forty-seven cases above average weight and enjoying excellent health, eight years after operation.

The fate of the tumor has been the subject of numerous investigations, of which Wollstein's are the most complete. In a histological study of the pylorus in twenty-five infants who died at various times following operation, she found that a regular involution of the musculature occurs. Twenty-five days after operation there is only a narrow scar at the site of incision and the pylorus feels only slightly firmer than normal. Sixteen months after operation, only a faint line is seen and at two years the scar is scarcely visible.



(6) Illustration of the method of tying silk worm stay sutures over buttons as employed by Strachauer.

Of the factors affecting mortality all writers are agreed that delay in operating is the greatest cause of death. The most accurate prognostic feature is probably the loss in body weight. Goldbloom and Spence in reporting a series of 163 cases conclude that "in infants weighing less than 3500 gm. the mortality is increased three and one-half times" and that mortality increases in direct proportion to the weight lost previous to operation. The prognosis then must depend upon the time of operation, the preoperative and postoperative care and the skill of the individual surgeon.

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DISCUSSION

DR. FARR: Doctor Zierold has covered this subject very completely. I simply want to accentuate a few points.

There is a paper in the last number of the Surgery, Gynecology and Obstetrics on cardiospasm in which the author calls attention to the fact that we may have obstruction without thickening at the cardiac end of the stomach. We know that we may have the same condition at the pyloric end. He brings forward the theory that some irritation of the sympathetic nerve supply is a factor in the case in which no thickening is found. I feel that where thickening is found, the condition must be congenital. I would disagree with Dr. Zierold only in two points: (1) I believe that local anesthesia is the first choice; (2) I believe the transverse is better than the vertical incision.

I wish especially to stress the necessity for team-work. Our routine is as follows: An arm table is placed at right angles to the operating table and a pillow is placed upon this and then the baby is laid upon a pad of sterile cotton with his feet pointing towards the operating table. The feet are anchored to the operating table and a nurse holds the baby in position by grasping its arms between the shoulders and elbows. Obviously the patient may be con-

trolled in this manner. The skin is sterilized, the patient is draped, and the nurse, surgeon and his assistant are seated during the operation. The operating table is used as an instrument table and is at the surgeon's right. The abdominal wall is infiltrated, using about 20 c.c. of 1 per cent novocain adrenalin solution. The stomach, which has been previously lavaged, is emptied by making pressure upon the abdomen after the passage of a tube. The incision is made well above the liver edge. The pylorus is brought up between the blades of rubber-tipped forceps. The Ramstedt operation is performed, the incision always beginning at the stomach end. As soon as the submucosa presents, it is carefully separated by means of a blunt instrument, after which the thickened muscle may be completely divided. One fine catgut suture is then passed from the upper edge of the cut muscle and the pylorus is allowed to drop back. The suture is then passed through a tag of omentum and tied. In these cases we use a large number of through-and-through silkworm-gut sutures and leave them in place a full two weeks. We have found that if the baby is given a bottle of sweetened water during the operation, this will aid in allaying restlessness.

DR. HAYES: One or two points in the differential diagnosis may be mentioned. Strauss believed that cases in which the symptoms develop before the tenth or fourteenth day after birth are not true pyloric stenoses, but rather cases of phlorospasm. Giving the baby a bottle of sugar water and laying him on his back, one soon notices the peristaltic wave over the epigastrium. Taking this to the point of vomiting gives a very large peristaltic wave resembling a heaving tumor mass.

Dr. Zierold mentioned the necessity of making a small opening. This is especially indicated in the very much emaciated cases. Here it is sometimes almost impossible to close the wound tight enough to prevent leakage. I have seen one case in which the baby could force fluid through the wound just as we finished the closure.

DR. ZIEROLD (closing): With regard to etiology, in reviewing the literature, the first notable thing, of course,

is the disease classification. The German literature speaks almost entirely of pylorospasm with different degrees thereof. There are many who believe that there is no hypertrophy at all, but I believe that the work of Sauer has shown very definitely that there is such a thing as true hypertrophy of the muscle. Undoubtedly there are cases of pylorospasm which present the same train of symptoms, clinically at least, as a definite obstruction.

Veeder, Clopton and Mills tried to produce the condition experimentally. They took young animals and injected paraffin at the pyloric ring and were able to produce obstruction with dilatation of the stomach and big peristaltic waves. Evidently the presence of a tumor, even in a minor degree, can cause hyperperistalsis. It is also a fact that a tumor at the pylorus has been known to occur in fetal life.

As to differential diagnosis, when there are visible peristaltic waves and the patient vomits continuously and has starvation stools, this would be considered evidence of an obstruction in any other individual, and why should it not be in these infants?

I have operated on a baby in which I thought there was a true hypertrophy and the baby had been under the care of a very good pediatrician. On opening the abdomen we found no increase in size of the pylorus. The pyloric muscle was divided, and the obstruction was relieved. Strachauer reports a similar experience.

As to the time of operation, this is determined by the condition of the baby, and the amount of starvation and treatment it will tolerate. Stationary weight in an infant corresponds to weight loss in an adult, as the baby's weight should be rapidly increasing at this stage.

The time expended in operation is a tremendous factor in the mortality. I believe most cases will average about fifteen minutes.

Your choice of anesthesia is much like your choice of religion: a matter of training and custom, and subject to about the same amount of discussion.

COMPOSITION OF BISMUTH TARTRATES USED IN THE TREATMENT OF SYPHILIS

The A. M. A. Chemical Laboratory reports that there is considerable confusion concerning the chemical composition of the bismuth tartrates used in the treatment of syphilis. An examination of specimens made by the laboratory, largely to aid the Council on Pharmacy and Chemistry in passing on submitted products, shows that there is a wide variation in the chemical composition of these products, the bismuth alone varying from 31 to about 73 per cent. A specimen prepared by the method said to be used in the preparation of the product used in France as Trepol shows that this is not a potassium sodium bismuth tartrate but is, virtually, a basic bismuth tartrate containing small amounts of potassium and sodium salts as impurities. The Laboratory reports that Trepol, which the manufacturers declare to be complex potassium sodium bismuth-tartrate, does not have the composition claimed

and contains needless impurities, and indicated that the manufacturers have not exercised proper chemical control of the preparation. The product manufactured by the Dermatological Research Laboratories, which is claimed to be potassium bismuth tartrate and has been accepted for New and Non-official Remedies, was found to have the composition claimed. A product manufactured by the Powers-Weightman-Rosengarten Co., claimed to be a potassium sodium bismuth tartrate, was found to have the composition claimed.

The report finds out that, in view of the wide range in the bismuth content of this class of preparations, it is necessary that clinicians inquire carefully into the composition of the bismuth products which they use; that some of the bismuth compounds reported on have been used in so-called scientific research without their composition being known to the users, is a reflection on research. (*Jour. A. M. A., Apr. 4, 1925, p. 1067.*)

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION,
SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN
MINNESOTA MEDICAL ASSOCIATION, AND MINNE-
APOLIS SURGICAL SOCIETY

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its

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The rate for classified advertising is five cents per word with a minimum charge of \$1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VIII JUNE, 1925 No. 6

EDITORIAL

Malpractice

Developments incident to the meeting of the State Medical Association which was held in Minneapolis, April 27-29, 1925, serve to bring most clearly before the profession the important fact that suits for malpractice against Minnesota physicians are assuming an upward curve at what must be considered an alarming rate. There would seem to be no question but that sick people are receiving a higher grade of treatment at present than they have hitherto been offered. Improved diagnostic methods, higher educational standards, greater efficiency in hospital management and many other factors are accountable for this. One might be justified in assuming that under these circumstances the number of suits for malpractice would diminish rather than increase. While it is prophesied that the change made in the statute of limitations will have a tendency to inhibit the instigation of malpractice suits, and while we sincerely trust that this will be the case, this has no direct

bearing upon the question of the cause for the "epidemic" of onslaughts upon the medical profession in the recent past. It would seem that there must be some special forces at work, the nature of which we have been unable to discern.

A discussion as to all the probable causes for this rapid increase would perhaps lead us too far afield, but an analysis of the factors which might enter into the instigation of legal proceedings against a physician for alleged malpractice leads one to analytically consider the following: the physician who is being sued; the scientific standard of the treatment administered; some member or members of the legal profession; the patient or his sponsor; and two other elements, namely, the success achieved by former plaintiffs in obtaining verdicts in court or settlements without trial and the influence of members of our own profession in initiating and abetting suits of this nature.

As stated, while it is beyond the scope of this editorial to consider all of these and other agencies which may underlie the bringing of a suit for malpractice, and while it is improbable that we as a profession could greatly influence or mitigate any of them, there are, at least, two over which the medical profession may exert almost complete control. We refer especially to the settlement by compromise in instances where there is great probability that the case could be successfully defended but where the physician desires to avoid the annoyance and unsavory notoriety connected with court proceedings. (The fact that the physician who is protected by adequate insurance may make this compromise without financial sacrifice is, perhaps, too often a factor in the making of this concession.) In instances of this kind even though the amount involved may be small, the knowledge gained by the plaintiff's friends that settlement has been made is undoubtedly a great factor in encouraging the instigation of malpractice suits among those who may become cognizant of the procedure and who are willing to participate in this variety of blackmail. Secondly, we feel quite certain that the conviction so thoroughly stressed during our recent discussion of this subject at the state meeting, that almost every malpractice suit has, as its origin, the action of some member of our own profession, is based upon fact. If both of these latter premises are true, and that they are there seems to be no doubt, the medical profession must realize that great improvement is not to be anticipated un-

less a certain amount of "house-cleaning" within its own ranks is accomplished.

There is, of course, no comparison between the class of physicians who contribute indirectly to the number of malpractice suits through the use of compromising methods and those who deliberately by word or act become the initiative agent. Among the former a certain amount of missionary, educational and suggestive therapy is to be recommended. With those who deliberately lend themselves to the reprehensible action of initiating malpractice suits against their brother physicians, nothing but the most drastic measures will prevail, and it is to those that we will refer especially.

While all true physicians will deprecate the protection of any physician who has been palpably negligent in the treatment of a case, and while we realize that it is to our best interests to avoid the furnishing of such protection, an investigation of the individual merits of *all* malpractice suits will show that but *few* are successfully prosecuted and perhaps still fewer will show, upon careful analysis, that the defendant has failed to offer to the plaintiff a reasonable standard of service, the plaintiff's co-operation and other factors being taken into account.

That we have in our profession a few individuals who are willing, for financial or other considerations, to debase themselves, as well as their profession, is undoubtedly true. In what manner shall they be dealt with? Is not the medical profession becoming imbued with the spirit of laxity with which our country seems permeated during recent years? Are we not failing to make the punishment fit the crime? Each county society is endowed with the proper equipment, in so far as rules are concerned, with which to deal with this class, and yet is it not a fact that our county societies, acting through their boards of censors, are too often afflicted with a spirit of sympathy or that the respective county societies are composed of men who are not of a sufficiently high morale to mete out the deserved justice? We might cite an instance where a physician admitted to the board of censors of his county society that he had deliberately testified to a falsehood in an effort to wrongfully aid a plaintiff in a malpractice suit. After much discussion and deliberation the board of censors summoned up enough courage to recommend "suspension" of this individual from his county society. With the aid of his personal friends and a few

"left-handed" members of the county society he all but escaped this totally inadequate punishment. After being suspended for one year he is once more a member in good standing in his society and unless some unusually favorable set of circumstances allow the meting out to him of his just deserts, he will remain so. The only argument to be heard in his favor was that it had been the first time he had been "caught."

It is our feeling that until such time as the individual morale is sufficiently highly developed within the medical profession itself these "snakes in the grass" will continue to ply their trade and malpractice suits will be threatened without regard to the individual merits of the cases involved. If the cause of the bringing of malpractice suits is due largely to the action of individuals in good standing in our county medical societies is it not our duty to ferret out and to expel such members whenever possible?

The State Meeting

The recent meeting of the State Association held in Minneapolis was the largest in point of attendance in our history. There were 704 registrations, 323 of which were from without the Twin Cities. 269 from Minneapolis and 112 from St. Paul. This from a total membership of 1,922. The nearest approach to this meeting in the way of attendance was at the 1920 meeting in St. Paul when 626 registered.

The meetings held in the Twin Cities are always the best attended. For this reason the suggestion has been offered in various quarters that all our meetings be held near the center of population, preferably at the University. The proposition, however, was not even considered by the House of Delegates and the variety lent by meeting at times in Rochester and Duluth lends spice to the life of the Association.

The participation by Dr. Haggard, the president of our national organization, who in addition to his official capacity is most attractive personally, and the presence of Dr. Billings and Dr. Woodward, who are both so intimately associated with the official life of the American Medical Association, attracted many of our members.

President Burnap is to be particularly congratulated on the success of the meeting. Only those who came in contact with him officially know the

energy he expended in choosing his committees and in lending his presence to committee meetings. The scientific program was among the best and the experiment of holding general clinical sessions was a success. The large attendance at the Monday evening meeting devoted to the discussion of medical economics showed the general interest in the subject. A similar meeting might well be held next year.

The joint meeting with the annual Minneapolis Clinic Week doubtless added to the popularity of the week's program as there was thus provided additional clinics for those who wished to remain over for them.

The outstanding feature of the meeting of the House of Delegates was the report of the success of the Committee on Legislation. For the first time in history legislation proposed by our Association was successfully engineered through the state legislature. This was largely due to the energy and sagacity of the chairman of the legislative committee, Dr. H. M. Johnson of Dawson. Never before has a member of our Association devoted so much time or sacrificed as much personally for the good of our State Association and the physicians and dentists of the state as has Dr. Johnson. The assurance that Dr. Johnson is willing to continue his services in legislative activities is almost too good to be true.

The study of medical defense made by the committee under Dr. E. S. Judd was most elaborate. The Council was authorized to make a contract with an insurance company for medical defense insurance on a group basis at the option of each individual member. Those who do not choose to take advantage of the group rate will have to defend themselves. Although not legally required to do so, the House of Delegates voted to defend members who may be the victims of malpractice suits for services rendered in the two-year period previous to June 27, 1925, at which date the new two-year statute of limitations goes into effect.

The officers elected for the year 1926 were:

President—Dr. Herman M. Johnson, Dawson.

First Vice-President—Dr. W. F. Braasch, Rochester.

Second Vice-President—Dr. Arthur N. Collins, Duluth.

Third Vice-President—Dr. E. G. McKeown, Pipestone.

Secretary—Dr. E. A. Meyering, St. Paul.

Treasurer—Dr. Earle R. Hare, Minneapolis.

Councillors—Dr. J. G. Millspaugh, Little Falls; Dr. F. J. Savage, St. Paul; Dr. H. M. Workman, Tracy.

Dr. J. C. Litzenberg of Minneapolis was re-elected delegate to the American Medical Association. The wisdom of re-electing delegates not only to the American Medical Association but to the State House of Delegates cannot be overemphasized. It takes several years to become acquainted not only with the other delegates but with the duties of a delegate. President Burnap was elected alternate delegate to Dr. Litzenberg.

The annual meeting of the Association in 1926 will be held in St. Paul. The date of the meeting lies at the discretion of the Council. There are good reasons for continuing to hold our meetings in the spring. Although the spring is the season for many of the national meetings, summer vacations do interfere somewhat with early fall medical meetings.

Accident Cases

Of the outstanding examples of extravagance that burden the taxpayer in large cities today, one of the most prominent is the handling of accident cases. Regardless of the fact that almost all accidents are covered by insurance, the average municipal hospital, in its zeal to function, is caring for accident cases from occurrence to convalescence.

An efficient emergency hospital centrally located, connected with the police department, could by means of its ambulances, reach the injured, render first aid and place the patient in his home or in a private hospital under the care of his own, his employer's or the hospital staff's surgeon. The useless and often harmful handling of the injured could be prevented by immediately placing him where he belongs rather than knowingly misplacing him in the beginning. The old well established relation between patient and doctor, employer and employee, private hospital and patient, insurance company and insured, is jeopardized by allowing the municipality to continue in this particular type of business to the extent they are doing.

The insurance premiums paid by the employers and motorists are ample to take care of the entire expense of the accident, and it is therefore unjust and unbusinesslike to make the taxpayer pay for care for which funds have already been provided.

Consideration of the above problem might result in better care for the injured, private hospitals and the surgeons receiving promptly patients that are rightfully theirs, the insurance companies discharging their own obligations, and most important of all, lessening the municipality's activity in business.

The malfunction of many municipal hospitals is to blame for their overcrowding. Take away from them the emergency accident work that can pay its own way and the most of these institutions will be found large enough to take care of their indigent for many years to come.

C. C. K.

MISCELLANEOUS

An offer of a site for the construction of a new Minneapolis General Hospital has been made to the City of Minneapolis by the University. In order to inform the profession of the details of the proposal, copies of the original communications are being published.

PETITION TO ROCKEFELLER FOUNDATION AND GENERAL EDUCATION BOARD

The Board of Regents of the University of Minnesota petitions the Trustees of the Rockefeller Foundation and the Trustees of the General Education Board of New York City for a grant of \$2,000,000 to be used in completing the hospitals and teaching laboratories of the Medical School of the University of Minnesota, in erecting a dental building as a part of the medical plant, and in purchasing land adjacent to the Medical School for the erection of the Minneapolis City Hospital thereon.

The Board of Regents of the University of Minnesota agrees to undertake to match the grant with an equal sum by private gifts or by state appropriations, or both, to be used for the purposes stated above.

The Board of Regents requests that it may have, if possible, until July 1, 1929, to provide its share of the total sum. While the Board of Regents confidently hopes and expects to raise its share of the total sum before July 1, 1925, it wishes to point out that a peculiarly distressing economic situation exists in the Northwest at the present time and that this situation may still prevail at the time of the next session of the Legislature in 1925.

The Board of Regents requests the Rockefeller Foundation and the General Education Board to allot their gifts, if possible, in sums of \$200,000, when matched by a corresponding sum by the University, until enough money has been provided in this way by the Rockefeller Foundation and the General Education Board to enable the University to purchase the land necessary for the location of the Minneapolis General Hospital thereon. It is expected that the purchase of the land will require \$1,000,000 or less. If this plan is agreed to it may enable the University to pro-

ceed more rapidly than it could otherwise with the purchase of the land, and this is desirable, as the land is increasing in value every year.

The Board of Public Welfare of the City of Minneapolis joins with the Board of Regents in petitioning the Rockefeller Foundation and the General Education Board for the gift insofar as it provides land for the erection of the new City Hospital, and it files herewith a resolution as evidence of its good faith and intention that it will proceed as rapidly as possible with the erection of the new hospital on the land thus purchased, the first unit of which will house 1,000 beds. It is also understood and agreed to by the Board of Public Welfare and the University of Minnesota that the newly erected City Hospital shall be used for teaching, research and educational purposes.

January 31, 1925.

RESOLUTION OF BOARD OF PUBLIC WELFARE OF CITY OF MINNEAPOLIS

March 4, 1924.

HONORABLE BOARD OF REGENTS,
UNIVERSITY OF MINNESOTA,
Albert J. Lobb, Esq., Secretary.
My Dear Sir:

THE BOARD OF PUBLIC WELFARE of the City of Minneapolis at its meeting held this 4th day of March, 1924, unanimously adopted the following resolution:

"BE IT RESOLVED: That the Board of Public Welfare of the City of Minneapolis unite with the University of Minnesota in requesting the Rockefeller Foundation to provide additional land upon which further hospital facilities can be erected for the use of the citizens of the City of Minneapolis."

Respectfully submitted,

(Signed) RICHARD TATTERSFIELD,
Secretary.

November 25, 1924.

Dear President Coffman:

At a meeting of the General Education Board, held November 20, 1924, the officers presented your communication dated March 22, 1924, requesting the co-operation of the Board in raising approximately \$4,000,000 in new money for carrying out certain extensive improvements in your Department of Medicine and Dentistry. Inasmuch as the General Education Board does not make contributions in the field of dentistry, the total amount under consideration was, according to your estimates, reduced to \$3,600,000. Towards this sum the General Education Board authorized its Executive Committee in its discretion to appropriate \$1,250,000, it being understood that the Committee would take such action if informed by you that the contribution in question would enable you to carry through your entire program. I shall be happy to bring the matter before the Executive Committee whenever we have had word from you to that effect.

With all good wishes, I am,

Very sincerely yours

ABRAHAM FLEXNER.

THE UNIVERSITY OF MINNESOTA, MINNEAPOLIS

DR. W. M. THEISSEN

April 28, 1925.

Dean E. P. Lyon,
Medical School,
University of Minnesota.
My Dear Dean Lyon:

You are privileged to state that it is the understanding of the University that in offering land to the city for the location of the Minneapolis General Hospital, no time limit is specified in which the city is expected to erect its hospital on said land. All that is desired is that the city shall signify through its proper official bodies its intention to accept the gift of the land and to locate the Minneapolis General Hospital thereon.

You are also privileged to state that the University is not concerned as to whether the entire General Hospital is erected at one time or whether the hospital should be erected a pavilion at a time as the needs of the city demand, the present General Hospital being used in the meantime and only gradually abandoned as the new hospital is developed.

It is understood that in accepting the gift the city would plan to build thereon eventually a hospital ample for the city's needs, but as to the time and manner of building, whether it is done all at once or in parts, the University is not concerned.

Cordially yours,

L. D. COFFMAN,
President.

OBITUARY

DR. EDWARD WALTHER

Dr. Edward Walther, 89 years old, widely known St. Paul physician, died Sunday, April 17, at his home, 433 Dayton avenue, after an illness of three months.

Dr. Walther had been a resident of St. Paul 57 years, having come there in 1868 from Germany, where he was born in 1836.

His father was Frederick Walther, a general in the German army, and his family was one of the oldest in Weimar-Saxony. The doctor's elementary education was obtained from tutors and his knowledge of medicine at the University of Leipzig.

His first visit to the United States was in 1853 with an uncle, but he returned to Germany to continue his education.

Surviving Dr. Walther are his widow, Mrs. Katherine Walther; a son, Edward, of Warren, Idaho, and five daughters, Miss Sophie Walther, St. Paul, Mrs. F. W. Southworth and Mrs. S. A. Perkins of Tacoma, Wash.; Mrs. F. T. Crowe, Seattle, and Mrs. Harry Hemminghouse, Portland, Ore.

Dr. W. M. Theissen, prominent Faribault physician and a leading figure in Faribault community affairs, passed away at his home, Friday, May 15, 1925. Death was caused by angina pectoris and followed a very brief illness.

At the time of his death Dr. Theissen was still in the prime of life, lacking a few days of being forty-nine years of age. He was born at Henderson, Minnesota, May 30, 1876, spending his boyhood there. He graduated from the Henderson high school and later attended the Hamline College of Physicians and Surgeons and the University of Minnesota, receiving the degree of M.D. in 1901.

Since his graduation he has practiced medicine at Jeffers, Minnesota, Henderson and Minneapolis, coming to Faribault in the fall of 1913.

On May 20, 1903, he was united in marriage to Miss Anna Littel of Minneapolis, who survives her husband. Dr. Theissen is also survived by three children, Victor, now a student at Notre Dame University, Lionel and Rose. He is also survived by two sisters and three brothers, J. A. Theissen, John N. Theissen, Henry Theissen and Miss Helen Theissen, all of St. Paul, and Mrs. F. W. Bertrang of Henderson.

Dr. Theissen, during the time that he lived in Faribault, was an untiring civic worker. As chairman of the streets and highways committee of the Chamber of Commerce, he took an active part in good roads work in Rice County. He was also an active member of the local council of the Knights of Columbus and was a past grand knight of the organization.

Dr. Theissen served four years as a member of the board of education of the Faribault schools, retiring from the board at the last election. He was also a member of the Catholic Order of Foresters, the Modern Woodmen of America, and of the Rice County, Minnesota and American Medical Associations.

DR. GEORGE L. S. SCHULZE

Dr. George Schulze died at his home in Minneapolis, Wednesday, May 6, 1925, following a long illness, at the age of sixty-three.

Dr. Schulze was a native of Germany and came to Elysian, Minnesota, from Vilsen, Hanover, in the early nineties. He practiced medicine there for several years, later moving to Owatonna, then to Minneapolis, where he had been in active practice for a period of sixteen years.

Dr. Schulze is survived by his widow and one son, George. Two daughters died several years ago.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

CHISAGO-PINE COUNTY MEDICAL SOCIETY

Members of the Chisago-Pine County Medical Society held their annual meeting May 12, 1925, at Pokegama, as guests of Pokegama Sanatorium. Dr. Callahan, the superintendent, conducted the members on a tour of inspection of the new building. The Sanatorium has grown away from the cottage method of treatment of tuberculosis. The rooms have very large windows with three sashes, making it possible to obtain two-thirds of the full opening. The ventilation is as nearly like outdoors as it is possible to have it. Cases of skin tuberculosis, artificial pneumothorax, and massive resection of ribs were shown.

At the business meeting the secretary reported that there were six additions to the society since his last report, namely, Dr. Freymiller, Dr. Holmes, Dr. Stewart, Dr. Stephan, Dr. Stratte and Dr. Callahan. One member, Dr. Gray, left the Society, going to the Pacific Coast. All the doctors in Chisago and Pine Counties are now members with one exception.

The same officers were re-elected: Dr. H. P. Dredge, President; Dr. Theo. Paulson, Vice President; Dr. C. G. Kelsey, Secretary. Dr. Dredge was elected delegate to the State Society meeting.

After the business session a banquet was served in the main dining-room, where the following papers were read:

1. The Treatment of Gonorrhea in Women.
Dr. R. T. La Vake, Minneapolis.
2. General Treatment of Diabetes and the Use of Insulin.
Dr. A. H. Beard, Minneapolis.
3. Infant Feeding.
Dr. Ray Shannon, St. Paul.
4. Appendiceal Peritonitis.
Dr. Warner Ogden, St. Paul.

The Society gave a rising vote of thanks to Pokegama Sanatorium, and especially to Dr. Callahan, for the sumptuous entertainment and the splendid program.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Dr. F. R. Huxley of Faribault was elected president of the Southern Minnesota Medical Association at the annual meeting held in Owatonna, May 18, 1925.

Other officers elected are: Dr. J. S. Holbrook, Mankato, first vice president; Dr. A. H. Logan, Rochester, second vice president; Dr. H. T. McGuigan, Red Wing, secretary-treasurer.

SOCIETY FOR BIOLOGICAL AND MEDICAL EXPERIMENTAL WORK

Papers and speeches concerning different phases of research work were given at a meeting of the Society for Biological and Medical Experimental Work, Wednesday, May 6. Officers for the coming year elected as follows:

Dr. F. H. Scott, re-elected chairman of the Society; councilors, George Fahr, medicine representative; R. A. Gortner, agricultural representative; J. A. Harris, science, literature and arts; and E. C. Kendall, from Rochester, Minnesota.

Immunization of children and adults against toxin of scarlet fever by heating toxin with solutions of castor oil soap was discussed by Dr. W. P. Larson and Dr. Woodward Colby.

Simple methods for determining non-protein nitrogen in blood was presented by Dr. P. Hench and Martha Aldrich. A paper concerning the isolation of a new hormone from the parathyroid gland, by which it will be possible to control convulsions and also cause an increase in the calcium salts in the blood, was read by Dr. Adolph Hanson.

LYMANHURST STAFF MEETING

The regular meeting of the Lymanhurst staff will be held at the Lymanhurst School, 1800 Chicago Avenue, Minneapolis. Saturday, June 20, 1925.

The following program has been arranged:

Subject to be announced later. Dr. Allen K. Krause, Managing Editor of the American Review of Tuberculosis, and Director of Tuberculosis, Johns Hopkins Hospital, Baltimore, Maryland.

Subject to be announced later. Dr. Philip P. Jacobs, Managing Editor of the Journal of the Outdoor Life, and Publicity Director of the National Tuberculosis Association, New York City.

Subject to be announced later. Dr. Linsly R. Williams, Managing Director National Tuberculosis Association, New York City.

STEARNS-BENTON COUNTY MEDICAL SOCIETY

At the annual meeting of the Stearns-Benton County Medical Society held on April 9, 1925, at the U. S. Veterans Hospital, the following officers were elected: President, Dr. Wm. Friesleben, Sauk Rapids; vice-president, Dr. A. A. Meyer, Melrose; secretary and treasurer, Dr. J. N. Libert, St. Cloud.

The following program was given by the members of the U. S. Veterans Hospital staff: Dr. R. D. Blackmore, *Manic-depressive Psychosis, Depressed*. Dr. L. A. Mangin, *Manic-depressive Psychosis, Manic*. Dr. R. E. Davis, *Constitutional Psychopathy*. Dr. G. D. Rice, *Encephalitis Lethargica Residual*.

Following the meeting the Doctors of the Staff gave a dinner for the members and a tour of inspection was made of the hospital.

THE MINNESOTA NEUROLOGICAL SOCIETY

The Minnesota Neurological Society holds its last meeting of the year at the Mayo Clinic, Rochester, on Saturday, June 13th. The forenoon will be devoted to Neurological Surgery, and clinical presentations. The afternoon will be devoted to papers and discussions by the members of the Mayo Clinic staff.

Officers of the Society for the year are: President, Dr. J. C. Michael, Minneapolis; Vice-President, Dr. Arthur Sweeney, St. Paul; Secretary, Dr. E. J. Engberg, St. Paul.

OF GENERAL INTEREST

Dr. F. W. Gaarde and Dr. R. M. Wilder attended the meeting of the Billings Club in Chicago the early part of April.

Dr. A. U. Desjardins read a paper at the meeting of the Wisconsin State Medical Association on Thursday, April 30.

Dr. W. D. Haggard, President-elect of the American Medical Association, was the guest of Dr. W. J. Mayo from April 29 to May 3.

Drs. E. S. Judd, D. C. Balfour and J. C. Masson attended the meeting of the Interurban Surgical Society in New York City on May 7 and 8.

Dr. John M. Culligan has announced the opening of offices at 718 Lowry Bldg., St. Paul, for the practice of urologic and general surgery.

Dr. B. B. Vincent Lyon was in Rochester on March 9 to give a Mayo Foundation lecture in which he discussed his method of non-surgical drainage of the gallbladder.

Dr. G. Allen Robinson of the radium department of the New York Postgraduate Hospital gave a Mayo Foundation lecture in Rochester on April 9. His subject was "Radium in Dermatology."

Dr. H. S. Plummer delivered the annual Alpha Omega Alpha address of the Minnesota chapter on Thursday, May 30. His subject was "The Function of the Thyroid in Exophthalmic Goiter."

Dr. R. D. Carman attended the meeting of the Texas State Medical Association in Austin during the first week in May. He read papers before this Association and before the Texas Radiological Society.

Drs. L. G. Rowntree, H. S. Plummer, W. S. Lemon, R. M. Wilder, W. M. Boothby, H. Z. Giffin and Norman M. Keith attended the meeting of the Interurban Clinical Club, which was held in Minneapolis on April 18.

"Clinical and physiologic study of colonic function" was the subject of the president's address delivered by Dr. E. L. Gardner, Minneapolis, before the annual meeting of the Minnesota Pathological Society, Tuesday, May 19, 1925.

Dr. Henning F. Wicse, graduate of Christiania University, Oslo, Norway, formerly a fellow at the Mayo Clinic and later associated with the Middlefurd Clinic at Eau Claire, Wisconsin, is now Associate Surgeon at the Sivertsen Clinic, Minneapolis.

Dr. Herbert Evans, Professor of Anatomy, University of California, came to Rochester April 3 to speak on "The Relation of Nutrition to Reproduction." This was the last of a series of lectures on nutrition arranged by the Mayo Foundation and the Mayo Foundation chapter of Sigma Xi.

Psychopathic work which has been carried on in the state by a group of men traveling about from one territory to another will be discontinued after July 1, as a bill for the continuation of the service was dropped by the Minnesota legislature.

Until the Rockefeller comprehensive plan goes through there will be no work among the mentally diseased of the state, according to members of the Medical school faculty of the University of Minnesota.

The date of the annual meeting of the Interstate Post-graduate Assembly of America under the direction of the Tri-State Medical Association to be held in St. Paul this fall has been changed to October 12 to 16 inclusive so as to avoid conflict with the annual meeting of the American College of Surgeons.

At the regular meeting of the Park Region Medical Society, held April 8, the following resolution was adopted:

Resolved—That any member who enters into contract with insurance companies to render professional services, either surgical or medical, at a reduced fee, shall be automatically excluded from membership in this society.

Dr. J. C. Litzenberg and Mrs. Litzenberg, of Minneapolis, are motoring in the east.

Dr. Litzenberg attended a meeting of the Gynecological society in Washington and of the American Medical association in Atlantic City, which were held in May. Dr. and Mrs. Litzenberg will visit their daughter, Avis, at Goucher college before returning home.

Dr. W. J. Mayo went to Washington to preside at the meeting of the Congress of American Physicians and Surgeons which was in session there on May 4, 5 and 6. The subject of his presidential address was "Contributions of Pure Science to Progressive Medicine." He also read a paper before the American Surgical Association on "The Relation of the Spleen to Certain Chronic Purpuras."

The files of the Transactions of the Minnesota State Medical Association have recently been checked and it has been noted that the numbers for the following years are missing: 1876, 1887, 1895. The State Association would appreciate receiving copies as gifts for their files or the loan of copies for the purpose of making reprints. It is requested that any member having copies of the missing numbers communicate with the office of MINNESOTA MEDICINE, 402 Guardian Life Bldg., St. Paul, Minn.

Ten medical students of the University of Minnesota have been elected this year to Alpha Omega Alpha, honorary medical fraternity, election to which is based on scholarship.

New members who were graduated from the medical school in December include Walter H. Ude, Frank J. Heck, Oslak M. Boe, Abel Ellingson, S. H. Sturmans, Allan F. Giesen, and Alano Pierce. The three members of the June class who were elected were Ruth E. Vories, Lawrence Carlson and Shattuck W. Hartwell.

Completion of the Todd Memorial and Cancer Institute on the Medical campus is scheduled for June 1. The building will not be occupied by the medical department until some time in July.

Constructed at a cost of about \$200,000, the institute is an addition and almost an exact duplicate of the present General hospital. The wing will contain 200 rooms with a lavatory provided for each of the 100 bedrooms. The x-ray room is to be tiled and the ceiling and walls are to be lined with lead.

A short course in tuberculosis, June 22 to 27, 1925, is offered the physicians of the state by the University of Minnesota in co-operation with the Hennepin County Tuberculosis Association and the Glen Lake Sanatorium. Dr. Allen K. Krause of Johns Hopkins and Dr. Gerald B. Webb

of Colorado will be the guest teachers for the course, which will also be conducted by twenty other clinicians and lecturers. All types of tuberculosis will be studied. The fee for the course is \$15 and registration should be made at the General Extension Division office, Room 5, Main Engineering Building, University Campus, Minneapolis.

Minnesota has been placed in a position to make a wholly new contribution to knowledge of the child of pre-school age as a result of a gift of \$245,000 for the establishment of an Institute of Child Welfare, announced by Dean F. J. Kelly. The gift will become available at the rate of \$49,000 a year for five years. It comes from the Laura Spelman Rockefeller Memorial, one of the educational funds established by the Rockefeller family.

The development of habits in children, the study of means for bettering child health, giving children the best instruction and the most normal reactions to their surroundings will be problems considered by institute workers. An infants' home, in which a small number of children ranging in age from two weeks up, and a nursery school, to which children up to the age of five years may be sent, will be established in connection with the Institute of Child Welfare.

In 1924 the State Medical Association approved the idea of a joint extension course for medical practitioners in conjunction with the University and appropriated the sum of \$100 for expenses.

Plans were laid under the direction of Dr. N. O. Pearce of Minneapolis, chairman of the State Committee on Hospitals and Medical Education whereby groups of physicians in the state may take advantage of a thirteen days' program to be given by two clinicians one day each week over a period of thirteen weeks. The groups pay the traveling and living expenses of the clinicians who devote their services and a slight overhead charge for administration work of the Extension Division of the University.

The tentative program includes the names of well known clinicians in the Association and the subjects are appropriate for postgraduate work.

Communications should be addressed to the General Extension Division, University of Minnesota, Minneapolis.

Maurice Visscher, an instructor in the department of physiology of the Medical school, University of Minnesota, was awarded the National Research fellowship in physiology, it has been announced by E. P. Lyon, dean of the Medical school.

Mr. Visscher will work under Prof. A. V. Hill, of the University college of London, England, for the year 1925-26. The fellowship, which is worth about \$3,000, is given by the National Research council.

Mr. Visscher will be a fellow in the department of medical sciences and his field will be physiology. He will continue the work he has been doing here on the physiology of carbohydrate utilization in the body. One of the problems involves a study of carbohydrate metabolism of muscles, a subject upon which Dr. Hill has done much work.

Mr. Visscher qualified for his B.A. degree at Hope college, Holland, Michigan, and took his medical work at the University of Minnesota, where he is a fellow in the department of physiology.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

COOK LABORATORIES:

Streptococcus Vaccine X plain
Acne Vaccine (Cook) Combination X
Typhoid Vaccine X Plain
Typhoid Vaccine XX Combined
Whooping Cough Vaccine (Cook) X Plain
Staphylococcus Vaccine Combined

CUTTER LABORATORIES:

Rabies Vaccine (Semple)-Cutter

EASTMAN KODAK COMPANY:

Resorcinol Monoacetate

HILLE LABORATORIES:

Lunosol

Lunosol Capsules, 6 grains

HYNSON, WESTCOTT & DUNNING:

Brom-sulphalein-H.W.D.

Solution Brom-sulphalein-H.W.D.

ELI LILLY & Co.:

Scarlet Fever Streptococcus Antitoxin
(Unconcentrated)

Scarlet Fever Streptococcus Antitoxin
(Concentrated)

H. K. MULFORD Co.:

Pollen extracts of Ash Tree, Bermuda Grass, Box Elder, Canary Grass, Cocklebur, Corn, Cottonwood Tree, Daisy, Dandelion, Dock, False Ragweed, Goldenrod, Johnson Grass, June Grass, Lamb's Quarters, Maple, Marsh Elder, Mountain Cedar, Mugwort, Oak Tree, Orchard Grass, Perennial Rye Grass, Plantain, Redroot Pigweed, Redtop, Russian Thistle, Rye, Sagebrush, Sugar Beet, Sunflower, Sweet Vernal Grass, Walnut Tree, Western Ragweed, Wormwood.

SHARP & DOHME:

Caprokol (Hexylresorcinol-S. and D.)

FREDERICK STEARNS & Co.:

Insulin-Stearns Single Strength
Insulin-Stearns Double Strength
Insulin-Stearns Quadruple Strength

E. R. SQUIBB & SONS:

Lentil-Allergen-Squibb

UNITED STATES STANDARD PRODUCTS Co.:

Scarlet Fever Streptococcus Antitoxin-U.S.S.P.

NEW AND NON-OFFICIAL REMEDIES

Butesin Picrate Dusting Powder.—It is composed of butesin picrate (Jour. A. M. A., March 15, 1924, p. 876) 5 per cent and sodium stearate 95 per cent. Abbott Laboratories, Chicago.

Iron Citrate Green-P. D. and Co.—A complex ferric ammonium citrate, containing ferric citrate equivalent to 16 per cent of iron and ammonium citrate equivalent to 8.1 per cent of ammonia. For a discussion of the actions and uses of iron preparations, see New and Non-official Rem-

edies, 1924, p. 165. Iron citrate green-P. D. and Co. is intended for intramuscular and hypodermic administration. Iron citrate green-P. D. and Co. is supplied in the form of ampules containing respectively $\frac{1}{4}$ grain, $\frac{3}{4}$ grain and $1\frac{1}{2}$ grain of the iron citrate green-P. D. and Co. Parke, Davis and Co., Detroit. (Jour. A. M. A., Apr. 4, 1925, p. 1045.)

Timothy Pollen Extract-Swan-Myers.—A liquid obtained by extracting the dried pollen of timothy with a liquid consisting of 67 per cent glycerin and 33 per cent saturated solution of sodium chloride. For the actions and uses of allergic protein preparations, see New and Non-official Remedies, 1924, p. 244. The preparation is marketed in the following forms: Series I, five vials containing doses Nos. 1 to 5, inclusive. Series II, five vials containing doses Nos. 6 to 10, inclusive. Series III, five vials containing doses Nos. 11 to 15, inclusive. Complete series, packages containing the fifteen consecutive doses. Swan-Myers Co., Indianapolis.

Allergens-Squibb.—In addition to the allergens-Squibb previously accepted (New and Non-official Remedies, 1924, p. 247), the following have been accepted: Bacillus Acne Allergen-Squibb; Bacillus Friedlander Allergen-Squibb; Bean (Kidney) Allergen-Squibb; Cauliflower Allergen-Squibb; Daisy Pollen Allergen-Squibb; Frog Legs Allergen-Squibb; Lentil Allergen-Squibb. E. R. Squibb and Sons, New York.

Group Allergens Diagnostic-Squibb.—In addition to the group allergens diagnostic-Squibb previously accepted (New and Non-official Remedies, 1924, p. 258), the following have been accepted: Group Allergens-Squibb Type V (Kidney Bean, Lentil, Lima Bean, Navy Bean, Pea); Group Allergens-Squibb Type XIII (Frog Legs, Lamb, Rabbit, Sweetbread, Veal); Group Allergens-Squibb Type XXIV (Corn, Golden Rod, Ragweed, Rye); Group Allergens-Squibb Type XXV (Bacillus Acne, Bacillus Coli, Bacillus Diphtheroid, Bacillus Influenzæ, Bacillus Pertussis, Bacillus Typhosus, Gonococcus). E. R. Squibb and Sons, New York.

Parathyroid Gland Desiccated-P. D. and Co.—The exterior parathyroids of the ox freed from fat, desiccated and powdered. For a discussion of the actions and uses of desiccated parathyroid gland, see New and Non-official Remedies, 1924, p. 224. The product is supplied in the form of tablets containing 1-10 grain. Parke, Davis and Co., Detroit.

Iletin (Insulin-Lilly) U-80, 10 c.c.—Each c.c. contains 80 units of Iletin (Insulin-Lilly) (New and Non-official Remedies, 1924, p. 152). Eli Lilly and Co., Indianapolis. (Jour. A. M. A., Apr. 11, 1925, p. 1119.)

Protein Extracts Diagnostic-P. D. and Co.—In addition to those protein extracts diagnostic-P. D. and Co. previously accepted (New and Non-official Remedies, 1924, p. 255) the following have been accepted: Apricot Protein Extract Diagnostic-P. D. and Co.; Cauliflower Protein Extract Diagnostic-P. D. and Co.; Daisy (Ox-Eye) Pollen Protein Extract Diagnostic-P. D. and Co.; Daisy (Yellow) Pollen Protein Extract Diagnostic-P. D. and Co.;

Friedlander Bacillus Protein Diagnostic-P. D. and Co.; Lentil Protein Extract Diagnostic-P. D. and Co.; Micrococcus Tetragenus Protein Extract Diagnostic-P. D. and Co.; Oak Pollen Protein Extract Diagnostic-P. D. and Co.; Paratyphoid Bacillus A Protein Extract Diagnostic-P. D. and Co.; Paratyphoid Bacillus B Protein Extract Diagnostic-P. D. and Co.; Pine Pollen Protein Extract Diagnostic-P. D. and Co.; Streptococcus (Hemolytic) Protein Extract Diagnostic-P. D. and Co.; Streptococcus (Non-Hemolytic) Protein Extract Diagnostic-P. D. and Co. Parke, Davis and Co., Detroit.

Group Protein Extracts Diagnostic-P. D. and Co.—In addition to the group protein extracts diagnostic-P. D. and Co. (New and Non-official Remedies, 1924, p. 259), the following have been accepted: Protein Extracts Diagnostic-P. D. and Co. Group 8 (Bean (Lima), Bean (Navy), Bean (String), Pea, Lentil); Protein Extracts Diagnostic-P. D. and Co. Group 10 (Cabbage, Cauliflower, Lettuce, Parsnip, Spinach); Protein Extracts Diagnostic-P. D. and Co. Group 20 (Colon Bacillus, Gonococcus, Staphylococcus Albus, Staphylococcus Aureus, Staphylococcus Citreus); Protein Extracts Diagnostic-P. D. and Co. Group 21 (Friedlander Bacillus, Micrococcus Catarrhalis, Micrococcus Tetragenus, Pseudodiphtheria Bacillus); Protein Extracts Diagnostic-P. D. and Co. Group 22 (Pneumococcus Types I, II, and III, Streptococcus Hemolytic, Streptococcus Non-Hemolytic); Protein Extracts Diagnostic-P. D. and Co. Group 23 (Typhoid Bacillus, Paratyphoid Bacillus A, Paratyphoid Bacillus B). Parke, Davis and Co., Detroit.

Whooping Cough Vaccine X Plain.—A Bacillus pertussis vaccine (New and Non-official Remedies, 1924, p. 320) marketed in packages of four 1 c.c. carpules (tubes) containing, respectively, 500 million, 1,000 million, 1,500 million and 2,000 million killed bacteria per c.c. and in packages of ten 1 c.c. carpules, each containing 2,000 million killed bacteria per c.c. Cook Laboratories, Inc., Chicago.

Staphylococcus Vaccine (Combined).—A staphylococcus vaccine (New and Non-official Remedies, 1924, p. 323) containing killed Staphylococcus albus and killed Staphylococcus aureus in equal proportions. It is marketed in packages of four 1 c.c. carpules (tubes) containing, respectively, 500 million, 1,000 million, 1,500 million and 2,000 million killed bacteria per c.c.; in single 1 c.c. carpule packages containing 2,000 million killed bacteria per c.c.; and in packages of ten 1 c.c. carpules, each containing 2,000 million killed bacteria per c.c. Cook Laboratories, Inc., Chicago.

Streptococcus Vaccine X Plain.—A streptococcus vaccine (New and Non-official Remedies, 1924, p. 325) marketed in packages of four 1 c.c. carpules (tubes) containing, respectively, 125 million, 250 million, 375 million and 500 million killed bacteria per c.c., in single 1 c.c. carpule packages containing 500 million killed bacteria per c.c. and in packages of ten c.c. carpules each containing 500 million killed bacteria per c.c. Cook Laboratories, Inc., Chicago. (Jour. A. M. A., Apr. 25, 1925, p. 1273.)

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

The regular dinner and meeting of the Minneapolis Surgical Society was held at the Elks Club, Feb. 5, 1925.

Dr. A. A. Zierold read a paper on the "Surgery of Hypertrophic Pyloric Stenosis," illustrated by lantern slides. The paper was discussed by Drs. Farr, Hayes and Zierold (See page 393).

Dr. R. C. Webb reported the following case of "Teratoma Testis: Located in the Abdomen."

Mr. A. F., twenty-seven years of age, salesman, admitted to Asbury Hospital, Jan. 20, 1925, discharged Feb. 3, 1925.

Family History.—Father living and well, 60 years of age. Mother living and well, 49 years of age. One brother living and well, 18 years of age.

Complaint.—Heavy feeling in abdomen and lump in abdomen, pain in small of back, frequency of urination, general run-down feeling and thought he was getting thinner, face was becoming drawn, and complained of lack of energy.

Present Illness.—In June, 1924, first noticed a lump in the right lower abdomen. It seemed to extend to the midline. His mother says that he complained of this lump three years ago. This lump seemed to be growing rapidly larger since June, 1924. In June, 1924, he noticed that he had to urinate frequently. This was not accompanied by pain but was merely the sensation of a full bladder. During the night had urinated two to four times since June. In the daytime if he drank a glass of warm water he would be required to urinate in about twenty minutes and two more times in the next half hour or hour. If he didn't drink water he could go several hours.

During the summer of 1924 if he walked much he would notice a heavy feeling in lower abdomen. During the past week or two the heavy feeling was constant when he was up and about.

During the fall of 1924 when he did considerable walking he noticed a dull pain in the small of the back about the same on both sides. This increased to the point where it was steady when he was up and about but was not present when sitting. He would notice it at night when lying down during the past two months.

About Oct. 1, 1924, he noticed that he didn't seem to feel energetic or ambitious and in November he noticed difficulty in getting to sleep. He would feel tired and irritable upon getting up in the morning. At about this time he felt that he was getting thinner and that his face was becoming more drawn. First went to a physician on Jan. 18, 1925, on account of the above complaints. Tumor did not cause constipation.

Past History.—Always healthy and strong until about 1919, when, after working in an office for about fifteen months, he became "run down" and consulted a physician and readily recovered with change of environment. In 1915 he was operated upon for an undescended right testicle and right inguinal hernia at the Midway General Hospital. The undescended testicle was presumably removed. (This was confirmed by conversation with his physician.) The testicle was never palpable to the patient

and so far as he knew it was not in the scrotum or the canal and he supposed it was inside his abdomen. Rupture appeared after pertussis.

Tonsils removed one year ago. Had measles, mumps, whooping cough, chickenpox, smallpox. Supposed to have had Bright's disease at age of three years. Had influenza in 1918 and again in 1919. Systemic history otherwise negative. Married in 1917 until 1922. There had been no increased libido or potency and he thinks there has been a decrease during past six or seven years.

Habits.—Occasionally smokes cigarets. No definite alcoholism. Average weight, 135. Last weight, 127 pounds.

Physical Examination.—Fairly well developed and nourished young man who appears in good health. The general physical findings are normal.

Abdominal examination reveals a large rounded cystic mass in the lower abdomen and this mass is revealed by inspection when the patient lies on the table. On palpation it is found to extend about one-half way up to the umbilicus from the symphysis. The mass fills the pelvis and extends slightly more to the right side than to the left. It is slightly tender on palpation. Auscultation negative. No local increase in temperature noted.

Rectal examination reveals a mass in the pelvis which is readily found on palpation. The mass feels cystic, fills the entire pelvis and a transmitted impulse can be felt on bimanual examination.

Urine normal.

Blood examination showed white blood count of 7,000 with 86 per cent of p.m.n.'s.

Temperature was 100° F. on two occasions on day before operation. Pulse and respirations were normal.

Operation.—Jan. 21, 1925, lower right rectus incision six inches long under local anesthesia. Large immovable tumor found. Anesthesia changed to gas and ether. The tumor was found to be firmly wedged into the pelvis and extending upward to a point midway between symphysis pubis and umbilicus. There was an attachment to the abdominal wall at a point midway between the right internal inguinal ring and the middle of the right iliac vessels. When this attachment was removed it was found to consist of vessels of the cord and the vas deferens.

The tumor became free and was readily delivered through abdominal wound. There was no evidence of enlarged lymph nodes over the abdominal great vessels. The appendix was removed and the incision closed.

Convalescence uneventful, the patient leaving the hospital on the thirteenth day.

The tumor measured six inches long and four inches thick and was of the shape of a hen's egg and resembled a testicle in coverings and appearance.

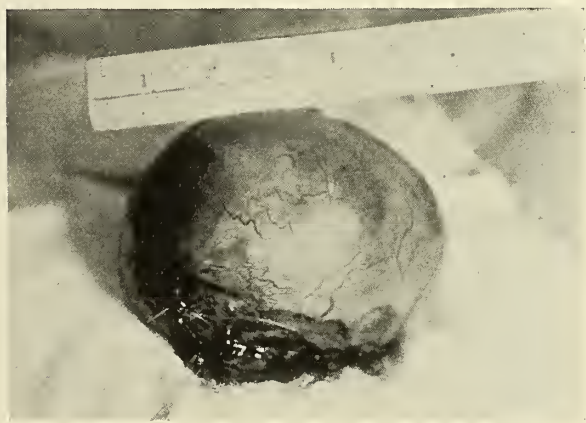
On longitudinal section it contained about four ounces of bloody fluid which was located in the degenerated center and in a few scattered cystic cavities. The central portion was of a cheesy color and was greatly degenerated, there being about an ounce of the material of the consistency of cottage cheese, but with a yellowish tinge. Through this degenerated portion a ramification of fibrous tissue presented. At the bottom of the tumor, near the point of attachment, there were some small areas resembling scattered islands of cartilage.

The microscopic examination revealed a picture made up of large round polyhedral cells possessing voluminous nuclei and a much reduced protoplasm. The nuclei were deeply staining and in various stages of subdivision, while the cytoplasm was pale. There were areas of hyaline and colloid degeneration present. There were some small areas resembling epithelial elements and others resembling muscle tissue. Diagnosis: Teratoma testis, mixed type.

The patient has been referred for deep x-ray therapy to the areas of possible immediate metastasis below the level of the renal vessels.

Discussion.—In a recent article, Tanner collected 101 cases of malignant tumor of the testicle. As a result of his study he makes the rather interesting statement that the abdominally located testicle is relatively immune to malignant changes, whereas the testicle in the inguinal canal is more apt to become malignant than in the scrotum.

In this case the patient states that the testicle was never present in the scrotum or the canal and his physician states that at the time of the first operation, approximately ten years ago, the testicle was in the abdominal cavity. His physician, however, states that he remembers the operation well and that the testis was found and removed. Unfortunately, the operation was performed in a hospital in which the records were poorly kept and there has since been a fire which destroyed some records. Our informa-



Gross specimen of teratoma testis.

tion concerning his present condition is based on the finding of a tumor resembling a testicle which was present on the distal end of an abdominally situated vas deferens and vessels resembling those of the spermatic vessels and cord.

Tanner classifies these tumors as follows:

A. Malignant:

1. Carcinomatous, large cell, large nucleus type undoubtedly closely related to
2. Mixed tumor type
 - a. Tumors containing cartilage, cysts, glands, etc.
 - b. Ordinary glandular structure tumors
 - c. Chorio-epithelioma

B. Benign:

1. Dermoid
2. Epithelial
 - a. Adenoma of the seminal tubules

3. Mesoblastic

- a. Interstitial cell tumors
- b. Fibroma
- c. Lipoma, Myxoma

In his studies of records of 600 cases the disease occurred about once in 2,000 hospital admissions. In a series of 465 cases which were followed, 81 per cent were found to be dead and 5.5 per cent were found to be living four years after operation. The mixed tumor type were found to be more malignant than the carcinomatous type. The prognosis in the abdominal type of tumor is considered especially bad inasmuch as the patients present themselves late in the disease.

Treatment consists in castration combined with some other procedure inasmuch as the results from castration alone have been disappointing. Coley's serum is mentioned as usual, but in a series of 52 cases quoted by Tanner, three survived the four-year period, which is approximately the percentage given by others. When the scrotum is involved the inguinal lymphatics should be included in the operative treatment. A further operation is advocated by Hinman among others and this consists in making a prolonged inguinal incision and stripping up the peritoneum as in the operation for removal of ureteral stone and removing the lymphatics overlying the abdominal vessels. With the advent of the deep x-ray therapy it is possible that additional help may be recorded.*

DISCUSSION

DR. K. BULKLEY: This case report of Dr. Webb is of peculiar interest because of the rarity of malignant disease of an abdominal testicle. It has been of particular interest to me inasmuch as I had occasion to look up the literature on the subject and report a case in *Surgery, Gynecology and Obstetrics* in 1913. The case I then reported was that of a patient, aged 42, who accidentally discovered a mass in the left side of his abdomen. He had been married for many years but his wife had never been pregnant. This patient was operated upon in January, 1911, and a mixed tumor of the testicle removed together with a section of small intestine which was adherent to it. I am calling this case to your attention at the present time inasmuch as it demonstrates that all such cases are not necessarily fatal. No gland dissection was done on this patient and yet when last heard of, about a year and one-half ago, this patient was still well and in good health.

There has been much discussion as to the exact pathology of these cases. Ewing considers that all of them originate in the rete testis. They are all of them encapsulated and for this reason peritoneal implantation is not common. Ewing considers them all to be teratomata irre-

*Subsequent history case of A. R. Teratoma of Testis, Dr. Webb. April 27, 1925, notes.

Deep x-ray therapy was given by Dr. R. G. Allison as follows: In six sittings 1150 milliamperes minutes of radiation were given to the right iliac and lower dorsal regions over a period of two weeks, ending Feb. 15, 1925.

The patient improved greatly and kept a weight chart which was as follows: February 13—118; February 22—121; March 1—123; March 8—125.5. He then had an attack of influenza.

The record was resumed March 29, when it was 128.5. April 5, 132, and April 19, 137.5. His greatest previous weight at any time in his life was 134.

He had no symptoms. A further series of deep x-ray treatments is being given.

spective of whether carcinomatous, sarcomatous or other types of tissue predominate. Practically all of them extend by the lymphatics. It is rare to find extension by the blood stream. The one type which may extend by the blood stream is the chorio-epithelioma and only two such cases as far as I know have been reported.

DR. T. H. SWEETSER: There is one type of tumor of the testis, the chorionepithelioma or chorioma, which is liable to metastasize extensively before the primary tumor of the testis has become of sufficient size to be noted clinically. I remember performing an autopsy while on the pathological service of the University, in which there had been no suspicion of tumor of the testis clinically,—and it was not suspected during the external examination at autopsy. The true condition was revealed only after finding large very hemorrhagic tumor growths in the spleen, lungs, and other organs. Of course, if such a growth had originated in an intra-abdominal testis, the metastases would have given the first possible warning of any tumor growth.

The meeting adjourned.

WILLARD D. WHITE, Secretary.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

CASE REPORT: MINNEAPOLIS GENERAL HOSPITAL

Division A, Medicine and Obstetrics
 DR. H. L. ULRICH AND DR. F. L. ADAIR
 Chiefs of Service
 Purpura Hemorrhagica and Pregnancy
 By DR. ARCHIE CARDLE AND DR. J. A. URNER
 Residents in Obstetrics and Gynecology

Patient was admitted to the hospital November 3, 1924. Age, 22 years. Para I; Gravida II (seven months). P. C.: Epistaxis, three months; subdermal hemorrhages, three months; hemorrhages from gums, three months; pregnancy, seven months.

For the past three months the patient had had severe attacks of epistaxis, occurring about twice a week and lasting from five to eight hours at a time. The loss of blood with each attack was about one cupful and the bleeding was always worse from the right nostril. At times the bleeding could be controlled by packing the nose with cotton. The day before the patient entered the hospital she had had an attack in the morning and another during the night, lasting three hours each time. Subdermal hemorrhages had occurred on different parts of the body for the past three months, the skin becoming red, then yellow, and finally blue-black. The patient stated that she had also had some bleeding from the gums for the past three days. The last menstrual period was April 10 to 23, 1924. All symptoms had occurred in the past three months.

Of acute infectious diseases, the patient had had only influenza. She had occasional headaches, of the frontal

type. The tonsils had been removed. Cardio-vascular gastro-intestinal, genito-urinary, and nervous systems were negative. The patient said that as a child she had had occasional attacks of epistaxis, but very slight, and said also that she bruised very easily.

Menses were variable and the period was quite severe for from six to seven days. While carrying the first baby the patient had some black and blue spots on legs and thighs and had occasional slight nose-bleed. The baby was normal and showed no blue spots.

Physical examination: The patient was a white, married woman, lying comfortably in bed, without pain or respiratory distress. The skin and mucosa were normal in appearance over most of the body. Around each knee there were a number of subcutaneous hemorrhages, black, not tender, and ranging in size from a pea to a twenty-five-cent piece. One large subcutaneous hemorrhage, about 2 inches in diameter, was found on the dorsal surface of the left forearm, and also a fresh hemorrhage on the medial surface of the right elbow. Smaller hemorrhagic spots were found on the forearms, chest, and abdomen. Examination of the gums revealed many fine bleeding points.

The heart was normal in size, the sounds were clear and regular, and there were no murmurs. The blood pressure was 105/75.

The abdomen was distended with a seven months' pregnant uterus. A few small subcutaneous hemorrhages were noted on the upper abdomen. Gravid uterus was palpable. The spleen was not felt. There was no tenderness or rigidity. Diastasis of recti was marked about the umbilicus.

The spine and back, and the extremities and reflexes were negative.

A provisional diagnosis of purpura hemorrhagica and pregnancy, seven months, was made.

Progress notes:

November 5.—Epistaxis, with loss of blood estimated at 200 c.c. Bleeding stopped spontaneously. Thirty cubic centimeters of whole blood were given intramuscularly.

November 6.—Epistaxis in the afternoon, which could not be controlled with local treatment. Four hundred cubic centimeters of citrated blood were given, followed by a slight reaction.

November 10.—Slight hemorrhage from nose which was easily controlled locally.

November 11.—Nasal hemorrhage at midnight; controlled locally.

November 13.—The patient had an uneventful day until 5 p. m., when she had a marked epistaxis and an emesis of a large amount of blood which she had swallowed. The hemorrhage was finally controlled. The spleen was not palpable.

November 14.—Four hundred cubic centimeters of citrated blood were given.

November 17.—The patient was feeling well. Platelet count was 100,000.

November 20.—The patient had another hemorrhage this morning. It was controlled locally.

November 22.—A transfusion of 500 c.c. of citrated blood was given, with slight reaction.

November 24.—A retrotonsillar abscess was opened.

December 2.—The patient's condition was good until

today, when she had another nasal hemorrhage. Another transfusion was given.

December 3.—The patient had labor pains for about three hours last night.

December 4.—Platelet count was 75,000. Patient was feeling well.

December 14.—Another peritonsillar abscess was opened on the right side.

dilatation, cervix thick, membranes intact, O. L. A. position, and fetal heart rate 135, very regular, in the left lower quadrant. Pains occurred at about five-minute intervals and lasted about fifteen to twenty seconds.

At 10 A. M. the dilatation was about three and one-half fingers, with the cervix dilating well and thinning out, and the membranes still intact. The fetal heart rate was 142 and regular. The pains became progressively more severe.

BLOOD

Date	Hemoglobin Von Fleischl	Erythrocytes	Leucocytes	Platelets	C. T.	B. T.
Nov. 3	63%	3,510,000	17,200	125,000	6 min. 15 sec.	8 min. 43 sec.
Nov. 7	56%	2,560,000	19,800	215,000		
Nov. 10	56%	2,780,000	8,700	25,000	{ Fragility Test { Hemolysis began at .46% { and was complete at .34%	
Nov. 11				45,000		
Nov. 13	49%	2,580,000	8,800			
Nov. 15	42%	2,000,000		50,000		
Nov. 17	45%	2,330,000	12,400	100,000		
Nov. 21	47%	2,520,000	18,800	50,000		
Nov. 23				40,000		
Nov. 25	49%	2,830,000	16,000	100,000		
Nov. 26				50,000		
Dec. 1	45%	2,600,000	9,300	75,000		
Dec. 2				100,000		
Dec. 6				70,000		
Dec. 9	49%	3,170,000		75,000		
Dec. 10	Coagulation time 5 min.					
Dec. 15	47%	3,150,000	13,500	75,000		
Dec. 18				150,000		
Dec. 19	52%	3,250,000		160,000		
Dec. 20				150,000		
Dec. 21				115,000		
Dec. 22				200,000		
Dec. 23				215,000		
Dec. 24	56%	3,100,000		170,000		
Dec. 27				170,000		
Dec. 31				80,000		
Jan. 2	75%	3,740,000		150,000		
Jan. 6				150,000		
Jan. 8	70%	4,600,000	9,500	100,000		
Jan. 12	70%	4,620,000		150,000		

December 17.—Last evening labor pains began very definitely and the patient was transferred to the obstetrical service.

There was no rise in temperature of any importance during the entire hospital course. The pulse rate increased in direct proportion to the amount of hemorrhage.

A special nasal examination was made and revealed numerous ulcerated areas in the anterior part of both nasal cavities, especially Kiesselbach's area.

The eye grounds were negative.

At about 8:30 A. M., December 17, the patient was transferred from the medical service to the obstetrical service. She was in active labor, with pain at regular intervals, and bloody show. Examination at 9 A. M. revealed two fingers

At 11:30 A. M. dilatation was nearly complete, the bag of waters was intact, in front of the head, the fetal heart was still in good condition, bloody show was very scant, and the pain had increased somewhat in severity. The patient was co-operating well. At 12 o'clock she was put on the table and at 12:45 the membranes ruptured. This was followed by very rapid descent of the head and at 1:10 P. M. a normal, full term, female child was delivered. There were no lacerations and the total loss of blood (measured) was 100 c.c. Pituitrin and ergot were given and the patient was put to bed with slight oozing and in very good condition. Her postpartum course was entirely normal. Her temperature remained normal and there was

no further bleeding during the time she was on the obstetrical service. The blood reports were as follows:

Hemoglobin				
Date	Von Fleischl	Erythrocytes	Leucocytes	Platelets
Dec. 17	45%	2,330,000	12,400	100,000
Dec. 21	47%	2,520,000	18,800	50,000
Dec. 23				40,000
Dec. 25	49%	2,830,000	16,000	100,000
Dec. 26	45%	2,600,000	9,300	75,000

The patient was again sent to the medical service, where she remained until her discharge.

The infant was a normal, female child, weighing 3100 gm. at birth. The child breathed spontaneously upon delivery and on physical examination it was found to be normal in all respects. The bleeding time and clotting time on the day of birth were normal. The urine was negative. Studies of the blood were made as follows:

	Platelet count
Dec. 18	80,000
Dec. 19	75,000
Dec. 20	100,000
Dec. 21	36,000
Dec. 22	50,000
Dec. 23	25,000

On December 23, 15 c.c. of whole blood were given intramuscularly. On this date the hemoglobin was 90 per cent, erythrocytes 6,000,000, leucocytes 15,900, polymorphonuclears 49 per cent, lymphocytes 43 per cent, transitionals 3 per cent, and plasma 5 per cent. The bleeding time was five minutes and the clotting time three minutes. December 24 the platelet count was 30,000. December 25, 15 c.c. of whole blood were given. December 27 the platelet count was 100,000. The patient was then on the pediatric service and no further notes or reports were made. The gain in weight was rather slow, but otherwise the child had an uneventful course in the hospital. It was discharged January 12, 1925.

OMENTAL TORSION: CASE REPORT

By DRs. J. W. and P. M. GAMBLE
Albert Lea, Minn.

Mrs. J. H. K.; married; age 34.

Onset December 26, 1924, with indefinite distress throughout abdomen, chiefly around the umbilicus and to the right of it. No nausea or vomiting. No chills or fever. Appetite good. Bowels regular. Patient was up and around until the morning of December 30th, when the dull abdominal pain increased to such an extent that she was forced to take to her bed and medical advice was sought.

Patient was first seen by us at 11 a.m. December 30th. The history taken at that time did not elicit anything more as to the present illness than what is mentioned above. The past history was entirely negative except for the usual diseases of childhood, and an indefinite history of peptic ulcer some fifteen years previous. The patient had been treated for ulcer at that time by a physician and the condition entirely relieved. Also for the past six years, and especially for the past two years, the patient had complained of a feeling as though there was something growing in the lower right abdomen. There was no history of any attack

in the past similar to this one. The family and marital history was negative. The patient was the mother of two healthy children, 7 and 10 years old. She had one miscarriage at four months eight and one-half years ago. The venereal history was negative.

Physical examination was negative except for abdomen and pelvis.

The abdomen was symmetrical throughout and no peristaltic waves or other abnormalities were made out on inspection. The whole right abdomen was exquisitely tender and the slightest pressure caused intense and definite pain. This was especially true one inch above McBurney's point. This exquisite tenderness was associated with a definite rigidity over the whole right abdomen.

On bimanual examination a definite resistance was felt in the right adnexal region. However, no definite mass was made out and the patient was but very slightly tender vaginally.

There was no elevation of temperature. The pulse was 88 and of good quality. Urine examination was entirely negative. The white blood count was 5,600.

The tentative diagnosis of: (1) ovarian cyst with twisted pedicle, (2) atypical appendicitis, (3) Meckel's diverticulitis was made. The patient was advised to enter the hospital for an exploratory laparotomy, but refused.

The patient was seen by us again on the morning of December 31st. The findings were practically the same as on the previous day except that the tenderness had increased so much that the patient would scarcely allow us to touch the right side of her abdomen. Vaginal findings were the same as on December 30th. The temperature and pulse remained normal, appetite good, and patient continued to have good bowel movements. The patient told us the pain increased markedly if she turned on one side or the other, and that she felt best if she remained absolutely quiet on her back. The differential diagnosis remained the same in our minds as enumerated above. The patient was again strongly urged to enter the hospital for an exploratory, but again refused.

At 2 a.m., January 1, 1925, one of us was called because of the increasing severity of the pain. The physical findings were the same as on December 31st. The temperature was 99.4 degrees and the pulse was 96. There was no nausea or vomiting. The white blood count was 18,200. The urine was negative. We advised immediate operative interference. Dr. W. I. King, Albert Lea, Minn., was called in consultation and was of the same opinion. The patient was operated on early January 1st.

On operation the pelvis was found to be entirely negative except for a definite and quite marked congestion. The same congestion was present in all the viscera of the peritoneal cavity. The appendix was kinked on itself three times but otherwise appeared quite normal. In the upper right abdomen, about one inch above the level of the umbilicus and on a level with the outer border of the right rectus, the greater omentum was found to be adherent to the parietal peritoneum over a space about the size of a silver dollar. There were no adhesions between the viscera and the omentum and there was no free fluid in the abdominal cavity. Thinking the condition might have perhaps been caused by a very small perforation in either the

stomach, duodenum or gallbladder, a very careful examination of these organs was made but nothing was found.

The omentum was readily freed from the parietal peritoneum and a goodly portion of it was seen to be twisted on itself once, forming a ball about the size of a lemon. The blood vessels in the part involved in the torsion were thrombosed and the tissue involved showed definite gangrene. The whole lower border of the omental apron was injected and the vessels were partially thrombosed. The omentum involved was excised and the appendix removed. The abdomen was closed in the usual manner without drainage.

The patient made an uneventful recovery and left the hospital in two weeks. Four months after operation the patient reports that she is feeling the best she has felt for the last six years.

thorough physical examination was made to search for any signs of damage or deficiency of the blood-forming organs, and the presence of any syphilitic taint. Only young and middle-aged individuals of both sexes were used, who were suffering from anemia due either to acute or chronic illness.

It was found that the administration of iron and arsenic, in the form of saccharated iron, Fowler's solution, Blaud's pills, Basham's mixture, saccharated iron iodide, and ammonio-citrate of iron, showed only a gain of 5 per cent in the hemoglobin, and 200,000 red blood cells, in the course of thirty days, whereas blood transfusions caused an average increase in the hemoglobin of 21 per cent, and 800,000 red blood cells, with a corresponding improvement in the general physical condition of the patients.

The writer therefore concludes that iron and arsenic preparations exercise practically no beneficial influence, and that blood transfusions accomplish the desired effect in a shorter period of time, and with a much greater degree of efficiency.

F. J. HIRSCHBOECK, M.D.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
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DUODENAL ULCER: AN ANATOMIC STUDY: H. E. Robertson, M.D., Estes H. Hargis, M.D., Mayo Clinic, Rochester, Minn. (Abstract from the Med. Clinics of North America, January, 1925). This interesting article is well worthy of reading by anyone interested in the complex subject of duodenal ulcer. The physiological and anatomical relationships of the duodenum are considered, followed by a comprehensive history of the disease from the time of Galen, who first mentioned ulcer of the stomach, and the casual recognition of duodenal ulcer in the Seventeenth Century. Careful statistics are a development of the last few years, and the writers conclude, as a result of their observation, that there is a distinct increase in the incidence of duodenal ulcer, beginning about twenty-five years ago, although they call attention to the fact that when the attention is focused on finding ulcers (or anything else) they are likely to be more numerous than in the ordinary routine examination.

In two thousand routine postmortem examinations at the Mayo clinic between the years 1920 and 1924, 18.9 per cent disclosed evidence of gastric or duodenal ulcer, 37 per cent of which were gastric and 63 per cent duodenal. In 7 per cent, both the stomach and duodenum showed evidences of ulceration.

As is well known clinically, there was a singular paucity of ulcerations in the remainder of the gastrointestinal apparatus.

Twenty-one per cent of the gastric ulcers, and 40 per cent of the duodenal ulcers were healed.

It is undoubted that many of these ulcers heal of their own accord without any consistent treatment.

Errors in the roentgenologic diagnosis of healing are several. In gastric ulcer there is frequently a misinterpretation of healing shortly after the institution of treatment, due to the deposition of a plug of mucus in the crater of the ulcer, which gives an apparent effect of healing, which is not real. In the healed duodenal ulcers there is frequently a pouching of the first portion of the duodenum, due to a contraction in length of the organ. This reveals itself frequently as a deformity, or even as a diverticulum;

THE COMPARATIVE VALUE OF BLOOD TRANSFUSION AND BLOOD TONICS IN SECONDARY ANEMIAS: Martin Lewis Janes, M.D., New York (Abstract from the Am. Jour. of Med. Sciences, April, 1925). The reasons for the widespread use of blood transfusion in recent years is due to: (1) The recognition of the procedure as an effective therapeutic agent. (2) The observation of iso-agglutination and the method of grouping of Jansky and Moss. (3) The elimination of highly technical mechanical difficulties.

The use of iron in the treatment of anemia has been carried out since Menghis, in 1746, who reported that he had found iron in the blood of man; and since Abderhalden, in 1906, abandoned his contention that inorganic iron could not be converted into hemoglobin, it has been generally accepted as a valuable therapeutic agent.

Whipple, in 1920, showed that inorganic iron, or arsenic, has little or no effect on blood regeneration without proper diet.

The writer's experiments have been carried on for the purpose of estimating the value of inorganic iron administration and blood transfusions respectively. The nature of the experiment was explained to the patients, and a

sometimes construed as an active ulcerative process, whereas healing has occurred. The contraction, pouching and displacement, of the healed duodenal ulcer, may cause duodenal stasis and a resulting intoxication.

F. J. HIRSCHBOECK, M.D.

PEDIATRICS

SUPERVISORS:

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SELECTION OF SUGARS IN INFANT FEEDING:
Randolph G. Flood, M.D. (Archives of Pediatrics, January, 1925). Up to the present time, sugars have been administered from a purely empirical point of view, with very little accurate knowledge of their exact metabolic behavior.

Dextrose is the most readily absorbed of all the sugars. It is probably the only sugar that passes the intestinal wall of the healthy infant as such and we believe that all the other monosaccharides must be converted to dextrose before absorption. This fact would explain the slow rise of the blood sugar curves for the other two monosaccharides, galactose and levulose. In short, dextrose can be absorbed without the energy expansion needed by galactose and levulose to convert them to dextrose.

Because of this, the marantic infant, with marked limitation of digestive energy, handles dextrose most readily. The ease and speed of absorption of this type of sugar makes it especially valuable in fermentative diarrheas, where it is necessary to supply some type of sugar as an antiketogenic agent, because it is entirely absorbed by the small intestines, and there is no pabulum to reach the colon to undergo fermentation. Karo corn syrup is a representative sugar of this group. It is quite inexpensive.

The above statements are true for maltose and the various dextri-maltose preparations. Honey owes its ease of absorption to the free available dextrose in the mixture, and its laxative action to the levulose fraction, which is absorbed slowly, so that it eventually reaches the large intestine. These properties make honey a very valuable sugar in the treatment of constipated bottle fed infants, and in our hands have benefited these children a great deal.

The second group contains those sugars which do not give only dextrose on complete hydrolysis, namely, cane sugar, and lactose. These sugars are characterized by a prolonged absorption time, with a fairly low apex of the absorption curve, and some laxative properties. Lactose is a good example of this group. Quoting Holt: "Lactose is slightly laxative. In all intestinal disturbances, particularly where there is a tendency toward looseness of the bowels, lactose is poorly borne."

Cane sugar, the second sugar of this group, showed an interesting absorption curve. Weight curves are not as good with cane sugar as with dextrose. Sucrose has a very limited field with infants under three months. After this age, we have been able to demonstrate that the sugar is

absorbed with increasing facility up to one year, after which period it is handled without difficulty.

R. N. ANDREWS, M.D.

THE USE OF GLUCOSE SOLUTIONS WITH INSULIN IN THE ACIDOSIS OF CHILDREN: C. F. Gelston, M.D. (Archives of Pediatrics, January, 1925). The clinical entity or entities called acidosis are unquestioned even though the etiology remains obscure. So-called cyclic vomiting is unquestionably one and, to the author's mind, this has a right to retain its position as a distinct syndrome.

It is Thalhimer's opinion that the ketosis occurs when either insufficient carbohydrate is supplied to the body or when the carbohydrate metabolism is subnormal. In either case, incomplete combustion of the carbohydrate means incomplete burning of the fat. In starvation, the first factor is involved. In post-operative acidosis and in the acidosis of pregnancy, there is an abnormality in the carbohydrate metabolism, with a resultant vicious circle as vomiting continues. Such a cycle is only broken when utilizable glucose is furnished to the body. It is demonstrated that the administration of insulin, either to diabetics or non-diabetics, accelerates the rapidity of utilization of body glucose, so that there is perfect logic in the use of insulin with glucose.

Case—A. S., age 2 years.

Child entered hospital April 19, 1924, with history of severe diarrhea of 5-6 watery stools daily, fever, and early restlessness, which later became semi-stupor, 3 days duration. There was refusal of food, very little vomiting. Examination showed a well developed and nourished child, anemic (hemoglobin 40 per cent, r. b. c. 3,250,000) dusty, gray pallor, apathetic and drowsy, if undisturbed, but very irritable when aroused. The lips were dry and parched, the tongue coated, the eyes rather listless and deeply sunken with the characteristic black rings underneath.

An intraperitoneal injection of normal salt solution was given that evening. The next day, April 19, the child was extremely toxic, temperature 105.4, pulse 200, respirations 60; eyes sunken. He was irrational, picking at the bed clothes. The abdomen was distended. Sugar, acetone and diacetic acid were present in the urine. His condition became rapidly worse and an intravenous injection of glucose and insulin was begun. Collapse occurred and death seemed imminent; 150 c.c. of 2 per cent glucose with 5 units of insulin (Lilly) were therefore given subcutaneously. Within two hours the child was rational, his color had improved, the temperature began to drop, food was taken regularly and retained, and by evening the urine showed much less sugar, acetone, diacetic acid, and albumen, and by the next morning these were entirely absent.

In the course of the next two days, this steady improvement continued. On the 23d of April he was given a transfusion of 250 c.c. of whole blood, non-citrated (Dr. Brooks), because of his anemia and because of the known great stimulative value of this procedure to the rehabilitation of tissues and body functions. He was discharged in good condition on March 5th.

If seen early and before too extensive liver damage has been done, the results are spectacularly and dramatically successful. The mortality of this acute condition allied to

the intoxication of Finkelstein has always been extremely high. Any maneuver reducing it should be promptly employed.

R. N. ANDREWS, M.D.

WEAK AND FLAT FOOT IN CHILDREN: Samuel W. Boorstein, M.D. (Archives of Pediatrics, March, 1925). The term weak foot or flat foot is applied to a faulty position of the foot impairing its weight-bearing strength.

Weak feet and foot strain are present in children though not to the same extent as in adults and should be treated before disastrous results ensue.

The predisposing causes are general weakness, excessive weight, rickets and contracted tendo-achilles.

The direct cause is disproportion between the strength of the foot and the weight and strain to which it is subjected.

The symptoms of weak feet in children are: deformity, tired feeling when walking, and occasionally pain.

The proper shoe from early childhood is a very important item as a preventive of future disability.

The child should be instructed to stand and walk properly, viz., the feet parallel or even slightly turned in.

The causative factor, as knock knees, etc., must be remedied so as to prevent recurrence of the foot disturbance.

The acute foot strain should be relieved by rest and adhesive plaster strappings.

The flexible weak feet are treated by strappings and exercises.

The short tendo-achilles should be lengthened either by stretching or open operation.

If the case is severe a metal support may have to be prescribed but this must be constructed scientifically so that the child should not depend permanently on this support.

R. N. ANDREWS, M.D.

INTRACARDIAC TRANSFUSION: Max Dunievitz, M.D., and Helen Bruckman, B.S., M.D. (Archives of Pediatrics, February, 1925). Report of a case. About six hours after birth the baby vomited brownish fluid with mucus and streaks of bright blood. Slight bleeding from the cord was also noted at this time, which soon became more profuse. The clotting time was taken and found to be 12 minutes (capillary tube method). Twenty c.c. of the mother's blood were injected into the buttocks. However, vomiting of material containing bright blood and bleeding from the cord continued.

The injection of mother's blood was repeated after six hours, without checking the bleeding.

On the morning of April 2, 20 c.c. of blood from another donor was given intramuscularly, but proved as ineffectual as the mother's blood in controlling the hemorrhage.

It was decided to attempt an injection directly into the heart. Forty c.c. of known Group IV blood was obtained

(from Dr. Bruckman) in a luer syringe. The skin of the baby's chest had been previously sterilized with iodine and alcohol. The author (Dunievitz) introduced a No. 19 gauge intramuscular needle, attached to an empty syringe in the 4th interspace, about 2½ cm. to the left of the sternal border and directed medially and cephalad. As soon as blood could be withdrawn, indicating that the ventricle had been entered, the blood-containing luer was substituted for the empty one, and the blood slowly injected. Following this, there was definite but slight improvement in the child's condition. One hour later, 85 c.c. of the mother's blood was injected in the same manner. Immediately following this injection the color, pulse and respiration all improved markedly. No citrate was used.

On April 4, the clotting time had decreased to five minutes. The baby had been able to take and retain breast milk, and, aside from the swollen head, appeared normal.

On April 7, there was again some blood-streaked vomitus, so that another transfusion was deemed advisable. Fifty c.c. of blood was injected into the sagittal sinus without difficulty.

At the age of about five months, the baby contracted smallpox and died. No autopsy was obtained.

R. N. ANDREWS, M.D.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:

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L. W. BARRY,

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EXCISION OF THE CERVIX FOR ENDOCERVICITIS: Rattenberg and Schwartz (Surgery, Gynecology and Obstetrics, November, 1924). This author describes a technique for excision of the cervix in the treatment of endocervicitis. The distal end of an infected cervix shows marked inflammatory changes, but as the proximal end is approached near the internal os these changes are either barely perceptible or entirely absent, thus showing the efficacy of the surgical procedure described, so far as the removal of the infected area is concerned.

The operation consists of making anterior and posterior lips by an incision at the external os. Then one-half of the cervix, the entire granular area surrounding the upper portion of the cervical canal, is coned out. A vaginal flap previously liberated is then inverted into the hollowed out shell of the upper lip of the cervix and thus all the denuded areas are covered. The lower lip is then completed in a similar manner. The procedure cures the leukorrhea, does not interfere with normal dilatation during labor, and clears up the focal infection.

J. W. STINSON, M.D.

ROENTGENOLOGY

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PNEUMONOKONIOSIS IN MINERS OF THE RUHR DISTRICT: A. Boehme (Forsch. a. d. Geb. d. Roentg., Feb., 1925, v. 33, p. 39). The author discusses in great detail the condition of the lungs in pneumonokoniosis in miners from the clinical and roentgenological standpoint. All of his findings are based upon work done on 1,500 miners, in all of whom roentgen examination of the lungs was done routinely. He finds that both coal and stone dust are equally responsible for this condition. The time factor is of more importance, thus the longer a miner has worked in a coal field the greater are the lung changes. He has found positive evidence of this condition, roentgenologically considered, in a group of 81 cases. Most of the cases were of mild form with mild lung changes and did not give any special clinical complaints. Only 3 patients complained of dyspnea.

Roentgenologically he finds the early changes in the lungs as a fine mottling; sometimes in a network in the middle portions, the strands extending toward both hili. The hili are enlarged and very dense and poorly outlined. These findings are usually symmetrical, although more prominent on the right side. In this stage none of the patients showed any subjective or objective clinical findings; vital capacity being about 3,000 ccm. In some of these cases the roentgenograms were similar to those of tuberculosis, but on account of the location of the changes in the middle portions of the lungs and their symmetry, they are easily recognized as non-tuberculous.

In the cases of longer duration, the lung changes were very marked, namely: large homogeneous shadows were present especially in the peripheral portions of the lungs; the lower portions are always free from any changes. This is very characteristic. Sometimes the apices are also involved. The shadows extend below the clavicle on each side and toward the lower lobe to about the fifth rib. The hili are markedly enlarged and very dense, while the free tissue between the hili and the large lateral shadows appears normal. This picture is so typical of pneumonokoniosis that it should never be mistaken for any other condition. It is found in patients that have worked on the average about 20 years as coal miners.

In the very serious cases there are definite clinical findings, such as dyspnea on exertion, pains in the sides, cough, expectoration and night sweats; bronchial breathing is increased, moist râles are present, vital capacity is reduced to 1,500 ccm. Roentgenologically they show very extreme changes. The lungs are very mottled with dense homogeneous shadows extending into both sides; the lower portions of the lungs also show many branchings. The heart shadow is very indefinite and the apices are also involved.

The most outstanding feature in the early cases is that the clinical findings, which are practically absent, do not

correspond at all to the anatomic and roentgenologic findings.

The author expresses the view that tuberculosis is not found or associated with pneumonokoniosis. All of the patients affected with this condition have a very chronic course.

M. VELKOFF, M.D.

BASAL SKULL FRACTURES AS PROVEN BY ROENTGEN RAY EXAMINATION: Ernst G. Meyer (Forsch. a. d. Geb. d. Roentg., v. 33, p. 52, Feb., 1925). According to the author the reason why many basal skull fractures are found is because of the great distance between the object (fractured bone) and the film when the antero-posterior position is used.

The transverse basal fractures are found mostly through the middle skull fossa; while in the frontal and the posterior fossæ they are found very rarely. The fracture lines begin sometimes higher or lower in the lateral wall, sometimes going through the parietal bone at right angles to the middle fossa; in other cases reaching near the sella turcica when in some cases the anterior clinoid process is broken.

The fractures of the parietal, temporal and sphenoidal bones are brought out by exposing from the side as for a regular sella turcica position. One must be very careful not to mistake for fracture lines the blood vessel markings of the medial meningeal artery and its several tributaries, such as the tympanic and petrosal, which many times are well developed.

Occasionally there are longitudinal fractures of the base and most of them run through the labyrinth, where they will form or end in a star-like arrangement. Most of the fractures are produced by a great force applied to the skull. When fractures are produced through a fall on the feet the lines are usually arranged in a ring and are very hard to demonstrate.

M. VELKOFF, M.D.

BOOK REVIEWS

THE OXFORD MEDICINE. By Various Authors. Edited by Henry A. Christian, A.M., M.D., Hersey Professor of the Theory and Practice of Physic, Harvard University, and Sir James Mackenzie, M.D., F.R.C.P., LL.D., Consulting Physician to the London Hospital. In six volumes. Cloth. Price, \$90 per set. New York: Oxford University Press, 1921.

Oxford Medicine is a monumental piece of collaboration which would be impossible of detailed review by any one individual. I have used this system since its first publication for general reading and for reference and feel that I have some appreciation of its value. There are three things which I think are outstanding in this publication:

1. It is well edited, easily readable, and is being carefully kept up to date, as I can testify from my own personal experience. The only criticism I would have of the editions that are from time to time being sent out is that they seem to be more expensive than one should expect. How-

ever, that is a matter on which I am not capable of giving any definite opinion.

2. The standard of authorship of the various sections is uniformly high. In other words, each article is an excellent monograph on the particular subject discussed.

3. The bibliography at the end of each article is very complete and valuable, and is being kept up to date.

This work consists of six large volumes, the first one dealing largely with the fundamental sciences; an attempt to bridge over the gap between these and clinical medicine. It is a very excellent volume for general reading and in my opinion is probably the most educational feature of the system. It also includes an article by Wilmer and Rowntree on "Aviation Medicine," a subject which is not covered to any extent in the average text-book.

The succeeding five volumes cover the whole field of medicine, including the nervous system. In the second volume is a very excellent discussion on gastrointestinal diseases and a very well-written article on peptic ulcer by Dr. Sippy. This gives in a very concise form the essentials of Sippy's method of handling ulcer and is of great importance to the profession because of Sippy's prominence in this field, and although one may not entirely agree with his theories he was one of the outstanding clinicians of the last generation who treated peptic ulcer more successfully than any one else so far.

In Volume 4 the discussion of metabolic diseases is very valuable and not so voluminous that it gives one mental indigestion.

There is a lot to be said in favor of the monographic style of publication, the most important of which, it seems to me, is the fact that you get in review the impressions of an authority on his particular subject as to the relative value of the literature and you get the individual work of the author.

I commend the Oxford series for general reading and for reference both to students and practitioners.

CHAS. B. WRIGHT, M.D.

THE MEDICAL CLINICS OF NORTH AMERICA. The Mayo Clinic Volume. Philadelphia: W. B. Saunders Company.

This volume, of about four hundred pages, consists of approximately thirty-five articles by members of the Mayo Clinic staff. There are no surgical contributions, but all other departments are well presented.

An objection has been offered that the articles are not of the usual clinic type, but, rather, formal medical articles on the subjects.

They are still largely statistical, as has been the custom in articles emanating from the Mayo Clinic, but they are representative of the careful work done there from the clinical, laboratory and research standpoints.

The article on "Duodenal Ulcer: An Anatomic Study," by Drs. Robertson and Hargis, is instructive and valuable.

The Department of Urology is well represented by articles on the differential diagnosis of diseases of the urinary tract, both medical and surgical, by Braasch and Keith,

and one by Bumpus on "Pyelonephritis Treated With Mercurochrome."

Dr. William A. Plummer contributes an article on the interesting discovery in relation to the treatment of goiter with iodine notably in Graves' disease.

Brown's contribution on "Vascular Disease Affecting the Feet," which is more in conformity with the clinic idea, is comprehensive, and indicates careful work, in a field not notably emphasized in the literature.

Neurologists will find a study of one hundred cases of multiple sclerosis in relation to the ophthalmologic findings, by Gipner, of interest.

The subjects of "Headache" and "Vertigo," of universal interest to general practitioners, are comprehensively and extensively covered by Woltman and Parker.

Peterman establishes the low protein diet in epilepsy on a more consistent mathematical basis with the ketogenic diet.

The rôle of functional tests in diseases of the liver, by Dr. Rowntree, which promises to be of immense clinical value in the study of liver function, is considered in a careful analysis of their value.

F. J. HIRSCHBOECK, M.D.

ANESTHESIA FOR NURSES. Col. Wm. Webster, M.D., Winnipeg, Canada. C. V. Mosby Co., St. Louis, Mo., 1924.

The book is written in a very simple, concise form, covering the essential points in the history and physiology of anesthesia; anesthetic agents; methods and dangers of administration; explanations and illustrations and care of apparatus; preoperative and postoperative care of patient from the nurse's standpoint; an explanation of preoperative and postoperative medications and the advisability of an attempt on the nurse's part to get the patient's point of view.

K. CLEARY, R.N.

PATHOGENIC MICRO-ORGANISMS. W. H. Park, Anna W. Williams, and Charles Krumwiede. Eighth edition. Lea & Febiger, Philadelphia, 1924.

This is a new and somewhat enlarged edition of a well-known text-book. It has been brought up to date by the addition of brief discussions of various new discoveries in bacteriology, as the d'Herelle phenomenon, the wound anaerobes, etc. It is quite complete and abundantly illustrated. The frequent tabulations of material which can be presented in this way, and particularly the inclusion of a very complete table of all the pathogenic organisms and their essential characters, should prove an aid to students. The new nomenclature of the Society of American Bacteriologists is given parallel with the older terminology, which should prevent confusion. While not too voluminous to be used as a text-book, it is sufficiently complete both in subject matter and references to serve as a reference work.

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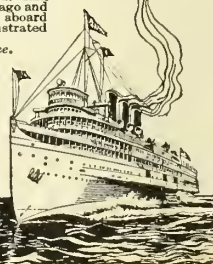
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MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association
Northern Minnesota Medical Association and Minneapolis Surgical Society*

VOL. VIII

JULY, 1925

No. 7

PERIODIC MEDICAL EXAMINATIONS*

FRANK BILLINGS, M.D.

Chicago

Modern medicine is characterized by definite knowledge of means and measures of successful disease prevention and of specific curative treatment of many of the infectious diseases of man and animals. Mankind now enjoys better prospects of continued health and a much longer span of life because of the practical application of these discoveries.

The acute infectious diseases of the respiratory tract continue to be a menace to health and life; but we may confidently hope that laboratory and clinical research may find, soon, definite means and measures of their prevention and specific treatment.

But while these accomplishments of modern medicine in the prevention and specific treatment of some of the infectious diseases are notably gratifying, our attention and interest are attracted to the steadily increasing annual mortality from cancer and other malignant tumors, heart disease and acute and especially chronic nephritis.

In 1921† the deaths from cancer and other malignant tumors, in the registration area of the United States, were 76,274, or 86 per 100,000 of the population; from heart disease 139,264, or 157.1 per 100,000; for acute and chronic nephritis 75,696 (acute 5,741, chronic 69,955), or 85.4 per 100,000; cerebral hemorrhage and softening (which may occur as a consequence of chronic nephritis) 74,111. For the entire continental and insular territory of the United States, 25 per cent may be added to make up for the deaths in the nonregistration area.

During 1925 the people of Minnesota and of the entire United States must face the fact that of each

100,000 of the population from 86 to 100 or more will die of cancer; 157 to 200 will die of heart disease; 85 to 100 or more will die of nephritis. Now with rational and feasible measures of procedure, these mortal diseases can be prevented in some people and if already existent and incipient may be eradicated or so modified as to greatly prolong life. In this connection it suffices to call attention to pulmonary tuberculosis. In 1921 the mortality from tuberculosis of the respiratory tract, in the registration area, was 76,298, a decrease of approximately 50 per cent of the annual deaths within twenty years. This result has been due to a consistent constant antituberculosis campaign characterized by rational individual hygiene and splendid medical management.

During the World War the draft boards and the medical officers of the cantonments rejected approximately 35 per cent (or 2,000,000) of the young men from twenty-one to thirty years of age who were registered for the draft because of physical or mental unfitness for military service. It was recognized that many of these young men had defects which were remediable; that with proper advice many defects would have been prevented; that early recognition would have made medical treatment much more simple and successful.

In keeping with these large figures, one may cite this fact: in 1923 of 500 high school boys of Chicago who were candidates for military training in the R. O. T. C., 34 per cent were rejected for defects, which in most instances had not been recognized.

With these preliminary statements of conditions which demand action of the medical profession, we must confess that as physicians and surgeons we have been slow to act in any well thought out plan to correct or greatly modify these abnormalities which have far-reaching influence on the economic status and the happiness and lives of a multitude of people.

Until now the chief work in the attempt to recognize and if possible remove or correct physical de-

*Read before the annual session of the Minnesota State Medical Association at Minneapolis, April 27-29, 1925.

†Report of the Bureau of the Census, Mortality Statistics for 1921. Issued by the Department of Commerce of the U. S., 1924.

fects has been done for infants, school children, policyholders in the large national insurance companies, employees of some of the transportation companies and some other industries by state and municipal health departments, medico-social agencies, lay commercial organizations who employ doctors to do the work and the medical employees of the industries. Now as an organized body the medical profession has just begun to awaken to an appreciation of its responsibility in this subject. We do acknowledge that it is our job; that we can no longer neglect it. Two years ago on the recommendation of the Council on Health and Public Instruction, the House of Delegates adopted a resolution to the effect that periodic health examinations are essential to chronic disease prevention and advised that the county societies organize to carry on this work primarily through the general practitioners who can encourage and secure the examination of members of the families for whom they are responsible.

Through the Council and later by the Bureau on Health and Public Instruction, periodic health examinations have been encouraged by making available to county societies and individual physicians printed forms for making records of physical examinations, pamphlets and recently a small book describing how to make the examinations. Articles have been published in *Hygeia* and in the official Bulletin and lectures, correspondence and other means have been used to further the project. The most striking and practical experiment in promoting periodic medical examinations by its members has been made by the Kings County Medical Society of Brooklyn, N. Y. More than a year ago special meetings were held for a period, at which the subject was discussed and ways and means formulated to carry the work on. At these special meetings the members examined other members and made records. This procedure served to arouse interest in the subject inasmuch as the methods pursued were instructive to those members of the society who needed it; and finally heretofore undetected defects were found in some individuals who deemed themselves entirely well.

In Maine the secretary of the State Medical Association has organized the county medical societies to work co-operatively with the state health department, the local health organizations, the antituberculosis society and various lay welfare units in

general disease prevention measures, including periodic medical examinations. Other state associations and some county societies have taken up the subject, but no uniform plan for carrying on the work has been considered by an authoritative body under the jurisdiction of organized medicine.

Surely the subject is of great importance to the public from the point of view of health, life, and economic and productive efficiency; it is just as important to the members of the medical profession whose obligation it is, if possible, to keep people from illness and injury and if possible to restore lost health as certainly and as promptly as conditions permit.

The job belongs to the members of the medical profession. It will not be an easy one. The best means and measures to do the work efficiently may not be applicable to all communities. It will be a never ending job, with new individuals coming into the field year after year. The periods between examination of individuals may vary from six months to a year or even two years. The first examination of an individual will be the important one for him and the physician, too, for the result, if satisfactory, will be likely to make him a promoter of periodic medical examination with his friends and neighbors; or, if unsatisfactory to him, may make him an obstacle to the success of the program in that local community.

To make the job successful all classes of the people must be considered—the well-to-do, those of moderate means, and the poor—even the indigent should have the benefit of such examinations. The problem will be less difficult of solution with that class of the public who can pay for any service rendered, but for the poor and indigent, the county or district society may assume leadership in devising ways and means, with public aid if possible, such as the establishment of ambulatory clinics where the indigent can be examined by individual physicians or by groups of doctors, when that method is necessary. Inasmuch as approximately 40 per cent of the sick people are unable to pay professional fees, it will lessen this obligation assumed by the medical profession if by our efforts we can keep them well.

Inasmuch as this is our job, it is the opinion of the writer that the most feasible method of carrying on this work is this:

The state society through the officers and district counsellors should adopt standard, yet simple available means of physical examination; adopt a printed form* for recording the results of the examination, in duplicate; this will afford one copy for the individual examined and one for the files of the physician; no copy should be placed in a public file and thus violate the important confidential relations of the physician and the individual.

Special meetings of county or of district societies should be devoted to a discussion of periodic medical examinations. The councillor of the district probably can give aid and advice to the officers of the county societies in his district. The Kings County Medical Society plan of learning the new things to be done in this work by examining fellow members and being examined by them, is a practical and rational way to begin.

The county society as such can inform the families of the territory through the mail by means of well thought out literature setting forth the benefits of periodic medical examination for the apparently healthy. With this literature may be included the advice to consult the family physician, who as a member of the county society presumably has consented to do the work, including the record making, to the best of his ability.

Right here one must emphasize the importance of accepting and doing the job seriously and well. Complaints from people have come to the writer's attention, that doctors to whom they have gone for such an examination have made a joke of the affair, turning away people with a remark, "I cannot waste time to look you over. I know you are sound as a dollar," or some equally discouraging statement.

Some practitioners may find embarrassment in making these examinations. The writer takes the view that every conscientious physician who is licensed to practice medicine is quite as competent to examine, decide the health status and give proper advice for maintaining health of the apparently well as he is to examine, diagnose and treat the ill and injured.

If the physician gives sincere service to the job and makes a written record, he will be apt to dis-

cover possible mistakes in subsequent periodical recorded examinations of the same individual. With many physicians this sort of work will stimulate study of books and laboratory and clinical methods of diagnosis.

This physician who finds puzzling conditions in his examination will request the individual for professional aid through a consultant, as would be done with a patient with obscure conditions.

The financial remuneration of the family physician or general practitioner should be the same as for a thorough examination of a patient; likewise the fee of the consultant.

In this work as with attendance upon the sick, just and equable fees should be requested for the service; but the conscientious physician will never demand a fee which will cause financial embarrassment by its payment.

Enough has been said of the examination of the indigent poor of the community. The well-to-do may seek examination from a diagnostic clinic or a private clinical group, which is a right not to be denied. But the writer hopes that the major portion of this work will finally be done and efficiently done by the general practitioner, who is or should be the family physician.

The writer recognizes that the program suggested is easily conceived and described; that its successful application will require unselfish leadership of members of the medical profession in every community; repeated special society meetings devoted to discussions of the subject; great patience and tact of leaders and men in the ranks; and individual and group tolerance and broadminded professional co-operation.

This or some other similar plan must be employed in the work for it is the job of the general practitioner aided, when necessary, by specialists and consultants. It is impracticable to suggest that a major portion of the work may be done by hospital, ambulatory or private clinical groups. Nor can it be efficiently done or at all done by lay organizations with a salaried medical personnel.

The success of this or any other adopted plan will require the moral support of a united profession and the active sincere work of the individual family physician, who must be the chief factor in the work.

*Printed forms for making records can be obtained from the Bureau on Health and Public Instruction at A. M. A. headquarters.

THE STATE SOCIETY: PRESIDENT'S
ADDRESS*

W. L. BURNAP, M.D.
Fergus Falls, Minn.

A fond mother, when shown the photograph of her daughter, complained that it did not do her justice. Whereupon the photographer replied, "Dear madam, what your daughter requires is not justice but mercy!"

The medical profession today, in viewing itself, frequently sees only through the eyes of the mother; while the public view is that of a merciless camera. We see ourselves as broad-shouldered, full-chested guardians of the public health, while the camera shows this broad chest is but a prominent abdomen, the result of prosperity built upon the public misfortunes. It fails to record the great intellectuality, high ideals, and personal charms which we so well know we possess; but rather emphasizes a marked convergent squint. The one eye with which we view the public is amblyopic, while the other, though functioning, gives a distorted image of our fellow practitioners. It shows us to be a trust, self-satisfied, still individually slow to recognize merit in members of our own profession.

We see ourselves as very scientific, we just love to be scientific. The public camera shows us ultra-scientific; so much so that people are at times in doubt, after consulting a physician, whether they have been to a doctor's office or through a Ford factory. Can we wonder that they occasionally resurrect the photograph of the old family doctor, and, as they gaze into his kind, care-worn face, this old verse runs through their minds?

"He walked with modest mien and kindly eye
Along the street, and few would ever guess
That, 'mid the hurrying throngs that surged and
pressed.

A master soul had passed them gently by.
His smile was such that little children hied
To bask them in its genial wholesomeness;
And when he spoke, his words of cheeriness
Shed welcome sunshine like a spring noon sky.
A simple man, yet none in all the land

More great. For he was ever found apart
Where beds of human suffering grimly stand;
And there, with soul alert, he lived his art—
The tender gift of healing in his hand,
And God's sweet law of service in his heart."

Possibly, if we develop a more sympathetic attitude toward the public, the old photograph will be forgotten and be replaced by that of a younger and more handsome man, whose every expression speaks sympathy and whose every word and act denotes skill and knowledge.

Malpractice suits are tremendously on the increase, in Minnesota nearly 300 per cent since 1918. Many insurance companies increased their rates, but, still losing heavily, withdrew; others are making up losses here from profits elsewhere. Every doctor should carry insurance with an indemnity clause, not alone for his own protection, but for the protection of his patient. A person employing a doctor has a right to average good services; and a doctor, in taking a case, agrees to furnish such. One who renders less breaks his contract, cheating the patient, who may, in that event, be entitled to compensation.

The profession must learn that the respect and confidence of the public will not be ours as long as we give perjured testimony. It is a shock to our pride when we realize that our most revered Dean Ritchie was forced to say that there are three degrees of liars; the ordinary liar, the damn liar, and the medical expert.

We also suffer in the eyes of the public because our virtues are too little known. The result of medical ethics frequently has been to emphasize our failings and obscure our virtues. In some way we must let our light so shine before men that they may see our good works and glorify the profession.

The State Medical Association has taken a few steps in this direction:

1. The Hennepin, Ramsey, and Olmsted County Societies, on their own initiative and expense, have once a week for the past four months broadcast radio talks on important medical and health subjects. They have been announced as coming from the Minnesota State Medical Association, with the county society responsible. Just how widespread the public interest has been it is difficult to say, but there is no doubt that the idea

*Delivered at the annual banquet of the Minnesota State Medical Association, April 28, 1925, at the Radisson Hotel, Minneapolis.

is good, and in time we will learn just how to catch the public ear. On behalf of the State Association, I wish to thank the societies for this progressive step.

2. The Committee on Hospitals and Medical Education, in conjunction with the Extension Division of the University, has prepared an extension course which will begin June first. Two medical authorities will be sent out once a week into two contiguous small centers, devoting one day to each, giving lectures and holding clinics. A sufficient fee will be charged to cover expenses.

The value of this to the physicians attending is too evident to require comment, giving as it does the maximum instruction at minimum investment of time and money. One benefit, however, which is not immediately manifest, is the favorable reaction, on the part of the public. To have it generally known throughout the communities that the best authorities are giving these courses must increase public respect for the profession and develop interest in the subjects considered.

This committee, and the ones which have gone before, have the gratitude of the association for the large amount of time and thought devoted to arranging this, the first course of the kind ever offered in the west. We commend the wise choice of subjects and the men selected to present them.

3. The great forward step of recent times is the newly created friendship between the profession and the legislature. This new spirit far transcends the important legislation which has been granted us. We will be strangely lacking in gratitude and loyalty if we forget our obligations to these senators and representatives at the next election, when, of all times, friends are most appreciated.

Great credit is due Dr. Herman Johnson, the Dawes of the medical profession, who left his large and lucrative practice, took up his residence in the St. Francis Hotel, St. Paul, and devoted his keen intelligence and boundless energy to this legislative task twenty-four hours a day for over four months. I have heard you singing his praises far and near, and all these songs are sweet in my ear, because the volume is such that it has raised me with Herman, out of the ordinary, to the exalted heights of the famous. My claim to greatness is firmly based upon the fact that some one or other once remarked, "It requires as much ability to

select the right man to perform a task as to accomplish it oneself."

We must heed the advice of Dr. Herman Johnson, who insists that we enter politics in a determined and intelligent way, recognizing the fact that, as tax-payers and influential citizens, we should stand on our own feet, not using other organizations as a screen. He has shown the legislature willing and anxious to do right, when shown the justice of a request. In order to give them information, a lobby must be maintained during the legislative session; this to be under Herman, as long as he can be induced to carry the burden.

Every medical man in Minnesota can have a part by contributing liberally toward the necessarily large expense. The question sometimes asked, "What can or what does the association do for me?" has been answered for many years to come. The important question now is, "What are you doing or going to do for the association?"

An organization as large and important as the Minnesota State Medical Association requires a manager who can devote to it his best thought and effort. A full time secretary serving year after year best fills the need. He should be able to join the traditions of the past with the hopes of the future in such a way that our progress will be ever forward and upward. The value of Dr. E. A. Meyerding's services are becoming evident on all sides. Though he has held office but a few short months, he is developing the organization already established and is getting results.

The association should maintain an office with modest but comfortable furnishings. At present we occupy a portion of a small room controlled by another organization. Here we have a typewriter and a desk. The typewriter is borrowed and the desk is not ours. If we had adequate headquarters, the officers, councilors, and committees could meet there, where records would be available. Not only this, but members, when in the Twin Cities, could make it their headquarters, if they wished; or phone in their city addresses; thus many pleasant and unexpected meetings might result.

"MINNESOTA MEDICINE" is one of the best state medical journals in the United States. No small credit is due the Editing and Publishing Committee, especially for their wise choice of the editor, C. B. Drake, whose modesty is only exceeded by

his accomplishments. and of the publisher, J. R. Bruce, ably assisted by Miss Olive Seibert, who succeeds in publishing this fine magazine at moderate expense.

We are proud of the Medical Department of the University; its long record of high standards and thorough instruction in the under-graduate school. We are especially proud that, through the Mayo Foundation, it offers opportunities for post-graduate study not equalled anywhere else in the world. This is *our* Medical School and, as its guardians, our criticism should always be constructive. As a unit, we should support it in its expansion, helping in every honorable way to secure the generous gift offered by the "General Educational Board."

The Ladies' Auxiliary has organized with a real purpose; we all take notice when our wives resolve. The fear has been dissipated that participation in business and political affairs will ruin woman as a clinging vine. She still clings, but with a firmer, more purposeful grip, so that now, not infrequently, we observe the interesting spectacle of a vine standing firmly erect, balancing a tottering tree. We therefore welcome their growing interest and solicit their support.

Our shortcomings are more glaring because of many high qualities. For the physician's occupation is the world's greatest profession: great in the number of persons devoting their lives to it; great in intellectual attainments and high character; great in the priceless knowledge, skill, and services rendered; great in diligence and progress in acquiring new knowledge; great in the supremacy attained over destructive diseases; and great in the power to insure health and happiness to all mankind.

The medical profession is one with high ideals; and if services rendered be the measure of success, it stands pre-eminent. We serve the young and the old, the weak and the strong, the success and the failure. We greet man as he enters the world, and ease his passing from it. We see the great souls of the humble, and the smallness of those who have been exalted. Finally, we view the anguish and remorse when it is realized that life's course has indeed been run, and life's failures stand illumined.

So it behooves us frequently to survey ourselves that we may learn wherein we fail in our responsibilities.

A NEW ANTIPNEUMOCOCCUS SERUM*

PRELIMINARY REPORT OF ITS EFFECT UPON THE COURSE OF PNEUMOCOCCUS PNEUMONIA

W. P. LARSON, M.D., and GEORGE FAHR, M.D.
Minneapolis

Larson and Nelson¹ have shown that rabbits may be immunized against pneumococci treated with sodium ricinoleate and that the serum of such rabbits protects normal rabbits against intraperitoneal and intravenous pneumococcic infections. On the basis of this work a series of investigations of pneumonia in monkeys treated with this serum and a series of clinical studies on patients with pneumococcus pneumonias treated with this serum were planned. This is a preliminary report upon the course of pneumococcic pneumonias treated with this serum during a recent epidemic at the Minneapolis General Hospital. Future publications will deal with a more extensive series of human cases, with the investigation of this treatment of pneumonia in monkeys and the preparation of the serum.

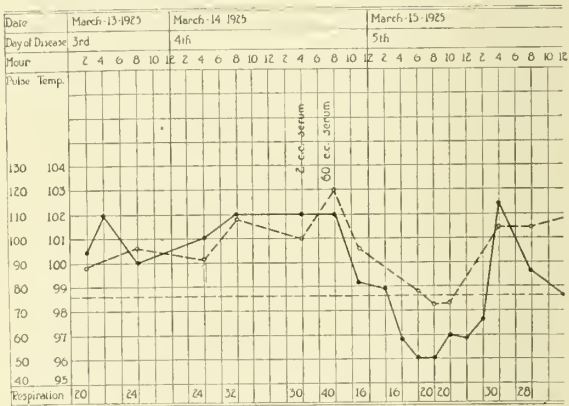


Figure 1

Eight patients with lobar pneumonia were treated with the serum but only seven will be reported upon. The sputum of these seven cases when injected into white mice gave cultures of pneumococci. The sputum of the other case, when injected into white mice, did not kill them and a sure diagnosis of pneumococcus pneumonia was not made in this case. This case followed normal delivery so that it may be doubted whether pneumococci were the etiologic agent.

*From the University of Minnesota and The Minneapolis General Hospital.

Case No. 1987 entered the General Hospital March 13, 1925, with a history of a sudden onset of severe chill March 11, 1925, followed by a sharp pain "like a knife stuck into left side." Weakness and dry cough developed in a few hours and within twenty-four hours after onset the patient brought up rusty sputum. A few hours after the chill the temperature was 101° by mouth. Dyspnea became very severe on the second day after the onset and the patient was brought to hospital forty-eight hours after the onset of the chill. Physical examination and x-ray examination (bedside plate) at time of entrance showed consolidation of the left lower lobe. The patient had all the appearance of a very sick man. Blood pressure on the first day in the hospital was 90/60. The sputum showed pneumococci. Seventy-two hours after the initial chill the patient was desensitized by subcutaneous injection of 2 c.c. of the serum and seventy-six hours after onset 60 c.c. of serum were injected intravenously. One hour after the injection the patient had a chill which lasted fifteen minutes. Two hours after injection, the patient began to sweat profusely. Three and one-half hours after injection the temperature and respirations were practically normal. The patient appeared quite different; the flush and cyanosis had gone and the patient said he felt fine. Twelve hours after injection the temperature was subnormal and the patient was feeling very well. Eighteen hours after injection the temperature began to

given a desensitizing dose of serum. Physical examination at this time revealed dullness over the right upper, middle and upper part of right lower lobe. X-ray showed consolidation of the right lung. Over this area were faint distant breathing with lengthened expiratory breath sounds in some places, bronchial breath sounds in other parts of this dull area. Crepitant râles were heard in the axilla, and over the upper part of the lower lobe on the right. Sputum showed pneumococci and killed a white mouse from which a pneumococcus was cultured. At 9 p. m., 70 c.c. of the antipneumococcic serum were given intravenously, just seventy-four hours after onset of the initial chill. At this time the leukocyte count was 38,000; temperature was 104° ; and the patient was having great difficulty in breathing. He was bringing up typical lobar pneumonia sputum and was cyanotic at this time. At 10 p. m., the patient began to perspire profusely and at 12 p. m., three hours after the injection, the temperature was down to 99° . At 9 a. m., April 7th, the patient no longer looked very sick; the cyanosis had disappeared and he said he felt fine. At 6 p. m. the interne was called and said that patient was cyanotic, looked badly and his temperature was up to 102° . At 7 p. m., 100 c.c. of the serum were injected intravenously. One hour later the patient had a chill lasting ten minutes. At 11 p. m., the patient was perspiring profusely and looking very much better. At 12 p. m. the tempera-

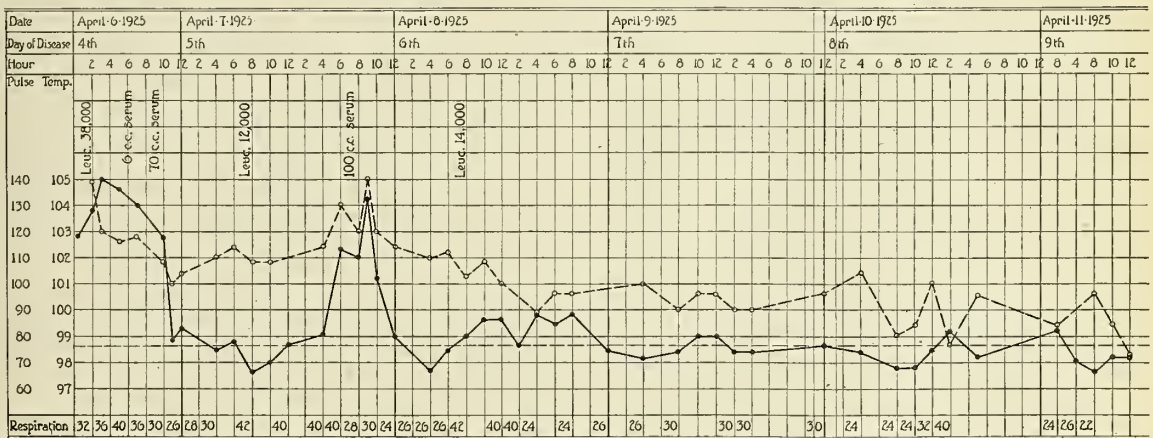


Figure 2

rise, respirations became rapid and labored and the patient again had the appearance of a sick pneumonia patient. Twenty hours after the injection the temperature had gone up to 102° and the patient was in appearance back where he was when the injection was given. This was our first therapeutic experiment with the serum and we were not prepared to give more. The patient's condition gradually became worse and he died on the seventh day of the disease. X-ray examination (bedside plate) shortly before death showed double lobar pneumonia (Fig. 1).

Case No. 3129 developed a chill, fever, and pain in the right chest on the evening of April 3, 1925. The patient soon developed dyspnea and cough with brownish expectoration. On April 6 the patient entered the Minneapolis General Hospital. At 6 p. m. of this day the patient was

given a desensitizing dose of serum. Physical examination at this time revealed dullness over the right upper, middle and upper part of right lower lobe. X-ray showed consolidation of the right lung. Over this area were faint distant breathing with lengthened expiratory breath sounds in some places, bronchial breath sounds in other parts of this dull area. Crepitant râles were heard in the axilla, and over the upper part of the lower lobe on the right. Sputum showed pneumococci and killed a white mouse from which a pneumococcus was cultured. At 9 p. m., 70 c.c. of the antipneumococcic serum were given intravenously, just seventy-four hours after onset of the initial chill. At this time the leukocyte count was 38,000; temperature was 104° ; and the patient was having great difficulty in breathing. He was bringing up typical lobar pneumonia sputum and was cyanotic at this time. At 10 p. m., the patient began to perspire profusely and at 12 p. m., three hours after the injection, the temperature was down to 99° . At 9 a. m., April 7th, the patient no longer looked very sick; the cyanosis had disappeared and he said he felt fine. At 6 p. m. the interne was called and said that patient was cyanotic, looked badly and his temperature was up to 102° . At 7 p. m., 100 c.c. of the serum were injected intravenously. One hour later the patient had a chill lasting ten minutes. At 11 p. m., the patient was perspiring profusely and looking very much better. At 12 p. m. the tempera-

ture was 99° . Next morning the patient felt very well and had the appearance of a well man except that he was very weak. Uneventful recovery (Fig. 2).

Case No. 3063 entered Minneapolis General Hospital at 2 p. m., April 7, 1925. He had experienced a chill and fever with difficult breathing on the morning of April 6th. Physical signs and bedside x-ray on entrance agreed in the diagnosis of lobar pneumonia involving the right upper and part of right lower lobe. The leukocyte count was 44,000. The patient was irrational in the evening of April 7th and at 9 p. m. 75 c.c. of serum were given intravenously. The temperature dropped to 102° at 12 p. m. There were no other outstanding effects of the serum injection excepting a drop in the leukocyte count to 10,400. It was impossible to get more serum for this patient and he went on untreated

by serum until the morning of April 8th (sixth day of disease), when the temperature came down to normal and stayed down and the patient made an uneventful recovery. Sputum injected into a white mouse gave a culture of pneumococcus, type III. See Figure 3.

Case No. L-2828 had had pneumonia previously on three occasions. On the afternoon of April 4, 1925, he had a chill, fever, and dyspnea. He did not cough until April 8th. Rusty sputum on April 9th showed pneumococci. On hospital entrance (April 9th), at which time the patient had physical findings and x-ray confirmation of a lobar pneumonia of the right upper and lower lobes, the process in the lower lobe seemed of recent origin. The patient was very cyanotic and breathing with difficulty. At 4:30 p. m. on April 9th, 100 c.c. of serum were given intravenously. The temperature was 104° at 7 p. m. and the patient began to perspire profusely. At 11 p. m. the temperature was down to 99.6° and the patient was no longer cyanotic. Every doctor and nurse who has seen the patient before remarked about the striking change for the better. On the

a diagnosis of lobar pneumonia involving the right lower, middle, and upper lobes, was made by physical examination and confirmed by bedside plate taken at time of entrance to hospital. Leukocyte count on entrance was 25,500. At 10 p. m., 100 c.c. of serum were given intravenously. At this time the temperature was 102.4° by mouth. At 11 p. m. the patient started to perspire profusely. At 6:30 a. m. on May 7th the temperature was down to 98° and the patient felt very much better. The patient had had lobar pneumonia six years previous and said he felt as though he had passed through the stage where in the previous pneumonia he had perspired freely and sweat profusely and which was the beginning of his recovery. In other words, he felt that he had gone through a "crisis." By noon the patient's temperature was up to 100°, and at 1:45 p. m., at which time temperature was 100° by mouth, 100 c.c. of serum were given intravenously. At 3 p. m. the temperature was 102°. At 10 a. m., May 8th, the temperature was 101.6° and at noon was 99.8°. At 10 p. m., May 8, it was 99° and at 4 a. m. on May 9 it was 93.4°.

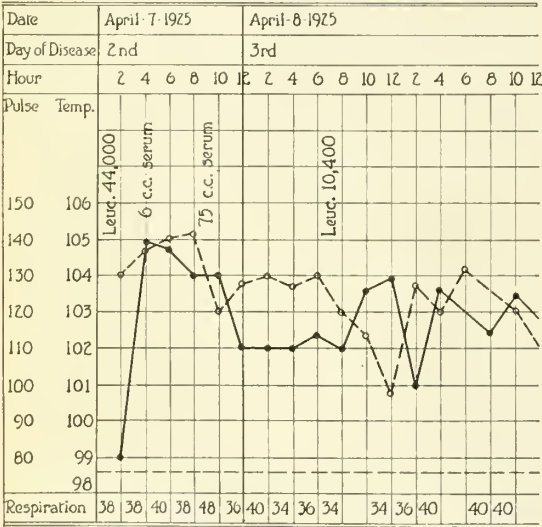


Figure 3

morning of April 10th the patient had a temperature of 99.4°, was breathing easily, and had no cyanosis. He said he felt very much better. Later in the morning of this day the temperature started to go up and by afternoon reached 103°. No serum was on hand because of the low rate of production at this time. The temperature stayed around 101-103° until the morning of April 12th, when the temperature fell to normal. At this time the patient developed a discharge from both ears. Later he developed a mastoiditis with a Bezold abscess. The left mastoid was operated May 1st. At present he is convalescing from the mastoid operation. No culture was made from the pus. Sputum injected into white mouse showed a culture of pneumococcus, type III. See Figure 4.

Case 3817 developed a chill and pain in the right thorax about noon of May 4, 1925. About the same time fever, cough and bloody sputum developed. About 4 p. m., May 6, he entered the Minneapolis General Hospital, at which time

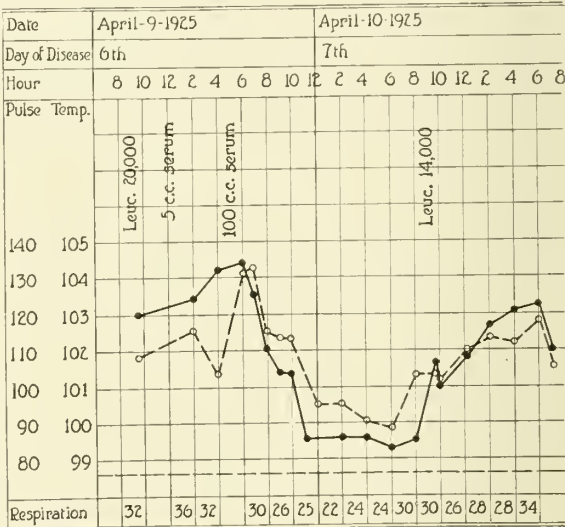


Figure 4

The patient felt well, excepting for pain in the right chest, from a period beginning with the morning of May 8th on until hospital discharge on May 19, 1925. X-ray on May 12th showed nearly complete resolution already at this early date. Sputum gave a culture of pneumococcus. See Figure 5.

Case No. 3688, age 60, developed erysipelas about the nose on May 1, 1925. On May 4th, a consultant discovered signs of pneumonia in the right upper lobe and advised the patient to go to the hospital. The patient entered the hospital on May 5th, at which time erysipelas had nearly disappeared but she had the symptoms and signs of lobar pneumonia. On entrance the temperature was only 100° by mouth; respirations were labored and not very rapid. The physical signs were those of marked dullness and bronchial breathing over the right upper lobe. X-ray taken at the bedside showed consolidation of the right upper lobe.

only, at this time. On May 6th the x-ray, as well as physical examination, showed complete consolidation of the right lung. The leukocyte count at this time was 12,000. At 2:30 p. m. 100 c.c. of serum were given intravenously. This was followed by a chill of seven minutes' duration and a rise in temperature from 103° rectal to 104.4° rectal. At 6 p. m. the patient began to perspire profusely and at

The injection was followed by a chill one hour later and the temperature rose to 105.4° at 4:30 p. m. At 5:30 p. m. profuse perspiration set in and by 9 p. m. the temperature had dropped to 99.6°. The patient was extremely weak and cyanotic. The temperature rose to 102° rectal by 1:30 p. m. The patient was cyanotic and irrational. From this time on there was little hope of the patient's recovery. She

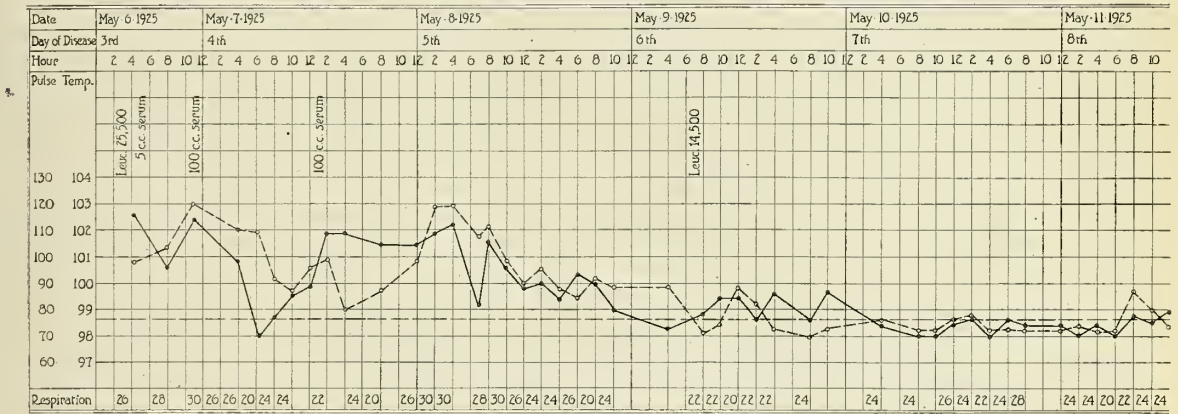


Figure 5

8 p. m. the temperature had dropped to 99° rectal, and she felt much better. At 11 p. m., May 7th, the temperature taken rectally was 102.4°. At 2 p. m., 50 c.c. of serum were given intravenously without any effect. The temperature remained around 102°-103° rectal until May 8th, when 100 c.c. of serum were given intravenously at 10:30 a. m., followed by a twenty-minute chill. The temperature rose to 105° by 12:30 p. m. and fell to 100° rectal by 4:30 p. m., following profuse perspiration. At 9 p. m., May 8th, the temperature was 99.6° rectal. The patient was very weak and showed a mild degree of cyanosis. By 11:30 p. m.,

became progressively weaker, was always irrational and was very cyanotic. By May 11th there was evidence from physical findings and x-ray that the process in the right lung was resolving but there was also evidence of a new consolidation in the left lung which progressed steadily so that by May 12th nearly the whole left lung was involved. The temperature was not high and on the afternoon of May 13th it was normal. The patient died early in the morning of May 14th. The leukocyte count went up to 25,000 following the first serum injection and remained between 25,000 and 30,000 until death. No autopsy was allowed. Sputum

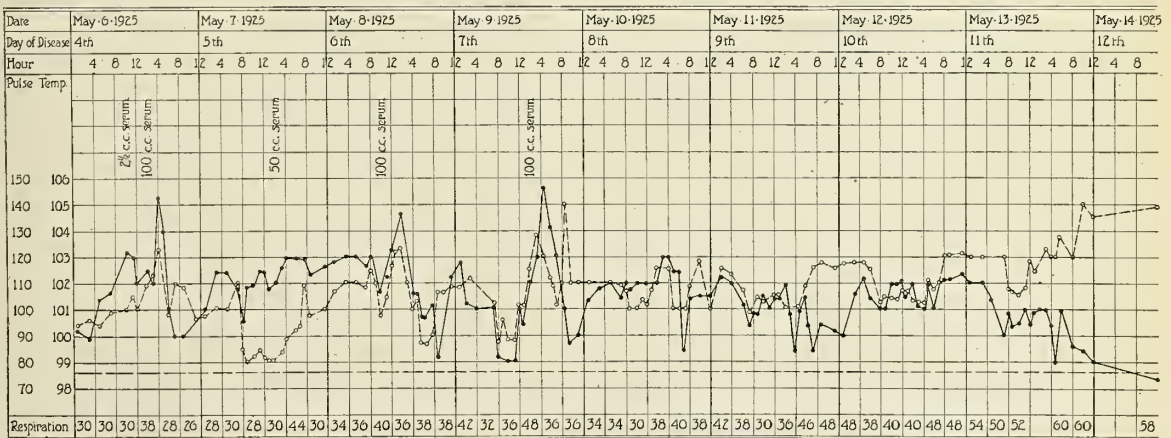


Figure 6

the temperature was 102.4° rectal. One a. m., May 9th, the temperature was 103° rectal. The patient was extremely weak and irrational all that day. The temperature dropped to 99.6° at 8 a. m. and went back to 102° by 2:30 p. m., when 100 c.c. of serum were given intravenously.

injected into white mice yielded pneumococci. See Figure 6.

Case No. L-3831 developed a chill and fever the evening of May 10, 1925. The next morning he had pain over the left upper thorax and began to cough rusty sputum. He

THE TREATMENT OF TOXEMIA ASSOCIATED WITH GASTRIC STASIS, OBSTRUCTIVE AND NONOBSTRUCTIVE*

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Intestinal obstruction ordinarily suggests shock, abdominal pain, distension, and vomiting occurring with such conditions as volvulus, intussusception, or strangulated hernia. A more subtle and less easily recognized type of ileus may occur with obstructing benign or malignant lesions at or near the pylorus. Occasionally after operations on the stomach a functional or nonobstructive ileus occurs which is clinically indistinguishable from that caused by actual organic obstruction. The recognition and treatment of the acutely toxic condition arising as a result of this type of organic or functional ileus will be discussed here.

SYMPTOMS

The clinical features of this toxemia are¹: vomiting, dehydration, neuromuscular irritability, prostration, low blood pressure, oliguria, or anuria, while fulminant cases sink into what may be termed a typhoid state. Vomiting is seldom forcible but is rather a "slopping over" of accumulated secretion. If vomiting does not occur, large amounts of secretion may be recovered by the stomach tube. Dehydration is usually extreme and the hemoglobin reading may be high, due to concentration of the blood. Neuromuscular irritability shows itself in twitchings of superficial muscles, and occasionally in tetany. It is probable that all cases of true gastric tetany fall into this group. Prostration may be extreme, with low blood pressure and the thready pulse of shock. The patients become drowsy, semicomatose, and may have a semicadaverous appearance which is sometimes relieved by a malar flush due probably to the high percentage of hemoglobin in the blood and the decreased vasomotor tone of the blood vessels. The physical signs of obstruction are often absent; the abdomen is not distended or tense, peristalsis disappears, and there is no complaint of severe abdominal pain. This is a clinical picture of approaching dissolution, and although patients with these

symptoms may be resuscitated in a dramatic fashion by appropriate treatment it is desirable that toxemia should be recognized earlier so that treatment may be instituted promptly.

DIAGNOSIS

The most significant diagnostic criteria are obtained by studies of the blood chemistry, which, if toxemia exists, will reveal an increase in the blood urea or other nonprotein fractions, a decrease in the plasma chlorids, and a tendency toward an increase in the alkali reserve of the blood, as shown by an increased ability of the plasma to combine with carbon dioxid. The rise in blood urea is probably due chiefly to increased tissue catabolism, since the nitrogen excreted in the urine is greatly in excess of what would be expected from the low intake of proteins in the food. In advanced cases there is actual renal damage; other factors concerned in the high urea content of the blood may be the slowing of the circulation and the low sodium chlorid content of the blood. The vehicle conveying waste from tissues to kidneys not only moves slowly because of the low blood pressure, but, when it arrives at the kidney, discharges its contents slowly and with difficulty, because of lack of sufficient electrolytes to carry on the osmosis.

This type of toxemia is usually readily distinguished from nephritis. In each condition there is a rise in blood urea, but in nephritis there is a tendency toward retention of chlorids and toward acidosis, whereas in this type of toxemia there is a fall in chlorids and alkalosis. The fall in whole blood and plasma chlorids is not completely explained by the vomiting of hydrochloric acid, since chlorid depletion has been observed experimentally and clinically without vomiting.^{2, 3}

It has been demonstrated that tetany occurs only in cases in which there is a high alkali reserve, and that tetany should be anticipated when the carbon dioxid combining power of the plasma rises above 100 volumes per cent, although much higher values may be attained without spontaneous carpopedal spasm.⁵ Kast, Myers and Schmitz have shown that acetone bodies may be found in the urine of patients with a high alkali reserve and a high hydrogen-ion concentration of the blood, that is, a condition of alkalosis. The erroneous conception that ketonuria means acidosis might conceivably lead to harmful therapy, for example, the use of alkalis.

*Read before the Minnesota State Medical Association, Minneapolis, April 27-29, 1925.

TREATMENT

In the treatment of toxemia with gastric stasis I have used intravenous injections of 10 gm. (1 per cent) of sodium chlorid, and 100 gm. of glucose (10 per cent) in 1,000 c.c. of freshly distilled sterile water. At least twenty minutes are allowed for each injection; 1, 2, or 3 liters of the solution are injected daily, the intravenous injections being supplemented by hypodermoclysis and proctoclysis. Water and hypertonic solutions of sodium chlorid and glucose are all diuretics of the first order. Hypertonic solutions of sodium chlorid and glucose also stimulate peristalsis, as has been shown experimentally. Sugar is a readily usable source of energy and spares tissue catabolism. Physiologic sodium chlorid solution has proved efficient in restoring depleted chlorids and in reducing the carbon dioxid combining power of the blood. Clinical improvement is heralded by free diuresis and the restoration of peristalsis. This improvement may be measured by the daily studies of the blood chemistry.

Precautionary measures. — The stomach is lavaged only to secure diagnostic data in the early stages and to remove excessive accumulations of secreted material which by their gross weight may embarrass the gastric motor function. The hypothesis that this secretion is toxic and that its removal eliminates one cause of the toxemia is not supported by clinical experience. If it can be made to move onward the fluid and the hydrochloric acid which it contains are undoubtedly useful adjuncts in treatment. Alkalis, for example, bicarbonate of soda, are contraindicated because they may increase the alkalosis and thereby predispose to tetany. This point deserves special emphasis since bicarbonate of soda has been widely recommended in textbooks and by surgeons as a constituent of solutions to be used postoperatively for lavage and for proctoclysis. The use of alkalis should be restricted to cases in which acidosis is suspected clinically and the suspicion is supported by adequate laboratory proof.

Intravenous injection must be regarded as a surgical procedure, safe only with perfect technic. Since repeated injections are usually necessary, the greatest care must be exercised to preserve the superficial veins. Needles must be sharp and the operator should be expert. The possibility of waterlogging a patient must be kept in mind, and

to avoid untoward results an accurate daily statement of the fluid balance should be prepared, together with daily estimations of urea, chlorids, carbon dioxid and blood pressure.

Obviously, it is desirable to recognize cases early so that appropriate treatment may be commenced early. Early diagnosis depends on a wide threshold of suspicion, prompt studies of the chemistry of the blood, and a comprehensive daily summary of the fluid balance, blood chemistry data and blood pressure in suspected cases. Gastric retention, falling blood pressure, and diminished urinary output are clinical danger signals. The precise measurement of the degree of toxemia is only possible by studies of the chemistry of the blood which are warranted by the high mortality rate in cases of severe toxemia.

SUMMARY

A method is outlined for the diagnosis and treatment of the toxemia associated with certain cases of organic and functional gastric stasis. The toxemia may be controlled in the presence of actual organic obstruction, thereby reducing the risk of the operation indicated to relieve the obstruction. In postoperative stasis simulating organic obstruction, relief from the toxemia by appropriate treatment frequently clears up all suspicion of organic obstruction. Early recognition of this toxemia depends on a wide threshold of suspicion, early studies of the chemistry of the blood, and an accurate daily summary of gastric retention, urinary output, fluid balance, and blood pressure.

REPORT OF CASES

Case 1.—A man, aged fifty-one, registered at the Mayo Clinic December 18, 1924. Three months before registration he had had a "bilious" sensation or a feeling of fullness immediately after eating, with occasional nausea and vomiting. After six weeks he was free from symptoms for one month, then for two weeks he vomited once or twice daily, always several hours after taking food. Sometimes the vomitus contained food eaten fifteen hours before, and recently it contained coffee-ground material. He had lost 45 pounds in three months.

When the abdomen was examined peristaltic waves were seen to move from left to right over the epigastrium. There was an ill-defined tumor in the right upper quadrant in the region of the pylorus. In the first gastric contents aspirated (500 c.c.) the total acidity was 20, and free hydrochloric acid 10. The diagnosis made was pyloric obstruction probably due to a malignant lesion. Although the patient was dehydrated, he was not prostrated, and operation was delayed because of an upper respiratory infection which gradually subsided. (Table 1.)

TABLE 1. TREATMENT OF TOXEMIA STASIS

Date	Intake, c.c.						Fluid bal- ance + or —	Output, c.c.					Blood chemistry				Hemoglobin, per cent	Blood pres- sure		
	Proctoclysis	Subcu- taneous	Intravenous	Mouth	Sodium chlorid, gm.	Glucose, gm.		Total fluids	Total	Emesis	Lavage	Proctoclysis expelled	Urine	Urea	Chlorids	Carbon dioxid combin- ing power		Systolic	Diastolic	
12-18-24				500			500	—	400	900	100	800		400						
12-19-24	250			1600	2.2		1850	+	850	1000	0	400		1000	62	290	116.4	85	80	50
12-20-24	500		2000	2100	24.05	200	4600	+	1450	3150	400	1500		1250		118.4				
12-21-24	500	750		1900	11.2	50	3200	+	1600	1600	200	200		1200	40	340	111.2	64	90	60
12-22-24	250			1800	2.2	25	2350	+	550	1700	0	500		1200	24	400	97.4	80	90	60
12-23-24	250			2450	2.2	25	2700	—	200	2900	0	1200		1700	28	360	101.7	82	90	60
12-24-24	300			2500	2.7	30	2800		0	2800	0	1200		1600	28	380	96.5	78	95	60
12-25-24	250			2400	2.2	25	2650	+	1350	1300	0	0		1300						
12-26-24	300			1500	2.7	30	1900	—	1200	3100	0	2000		900						
12-27-24	400			1350	3.6	40	1750	—	800	2500	800	1200		500	32	410	95.7			
12-28-24	900			2750	8.1	90	3150	+	1250	1800		1000		800						
12-29-24	500			2300	4.5	50	2800	+	1000	1800		0		1800	28	360	85.3	70		
12-30-24	900			2500	8.1	90	3400	+	950	2450		600		1850						
12-31-24	100			2000	0.9	10	2100	+	200	1900		450		1500						
1- 2-25	Operation, anterior gastro-enterostomy																			
2- 6-25														28	550	68.1				

At operation, January 2, 1925, a pyloric tumor, 6 by 4 cm., was found (Table 1). The tumor, which was fixed posteriorly by inflammatory exudate, was not considered resectable. An infiltrated node, which was removed, showed histologic evidence of carcinoma. An anterior gastro-enterostomy was performed, and convalescence was satisfactory.

Comment.—Although the depletion of plasma chlorids and the heightened alkali reserve were striking in this case, the blood urea was not high and the patient's condition did not appear dangerously toxic. Diuresis on the whole was satisfactorily maintained by administering water. It is noteworthy, however, that when the fluid intake was less than 2,500 c.c., the gastric retention increased and the urinary output decreased. It was difficult to administer fluids intravenously, and since indications for it were not urgent, this method was abandoned. The failure of the chlorids or of the alkali reserve to become adjusted may be contrasted in Table 2 and can be best accounted for by the removal of hydrochloric acid by gastric lavage and emesis, and by the fact that the sodium chlorid administered did not satisfy the demands of the depleted tissues.

Attention is called to the findings in the blood five weeks after operation.

Case 2.—A man, aged thirty-eight, was first observed in 1903, when he gave a history of the peptic ulcer type of dyspepsia, with repeated severe hemorrhages of three years' duration. A bleeding perforating duodenal ulcer, 1.0 cm. in diameter, commencing 1.5 cm. below the pylorus, was excised and the defect closed. A long appendix containing fecal stones was also removed. The patient remained free from symptoms until 1920, when there was a recurrence of mild ulcer dyspepsia. A rather severe hemorrhage occurred in November, 1924, and again March 17, 1925. The hemoglobin (Dare) was 52 per cent on March 20. The stools were free from evidence of occult blood March 30, 1925.

March 31, 1925, seventeen years after the first operation, a partial duodenectomy was performed; an area of ulceration 1.5 cm. in diameter being removed. The pylorus was split and an anastomosis made between the stomach and the end of the duodenum. The immediate postoperative course is recorded in Table 2. The patient was dismissed from the hospital in excellent condition April 24, 1925.

TABLE 2.—TREATMENT OF TOXEMIA STASIS

Date, 1925	Intake, c.c.						Fluid bal- ance + or -	Output, c.c.					Blood chemistry			Hemoglobin, per cent	Blood pressure
	Proctoclysis	Subcu- taneous	Intravenous	Mouth	Sodium chlorid, gm.	Glucose, gm.		Total	Emesis	Lavage	Proctoclysis expelled	Urine	Urea	Chlorids	Carbon di- oxid combin- ing power		
3-31	2000				0	0	2000	+ 2000	2000			0					
4- 1	2000				0	0	2000	+ 250	1850		1000	850					
4- 2	2000				0	0	2000	+ 700	1300		500	800					
4- 3	2000			205	0	100	2205	+ 1205	1000		300	700					
4- 4	1500			555	0	75	2055	+ 355	1700		900	800					
4- 5	2000			430	0	100	2430	+ 980	1450		325	1125					
4- 6	1500		1000	750	10	175	3250	+ 75	3175		425	2750	122	104.3	390		
4- 7	1500		3000	1335	30	375	5835	+ 2765	3070		45	3025	77	88	470		
4- 8	2000			1770	?	100	3770	+ 1825	1945		45	1900	49	76	500		
4- 9				2160			2160	360	1800			1800	31	77	470		
4-10				2210									23	61	560	53	

Comment.—In this case there may have been temporary organic obstruction due to inflammatory reaction at the site of the anastomosis, or stasis may have been due to transient inhibition of motor function from the necessary surgical trauma. In either case, it is important that the toxemia could be controlled without the necessity of further operative interference, such as the introduction of an enterostomy tube.

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DISCUSSION

DR. D. C. BALFOUR (Rochester): The complication which Dr. McVicar has described illustrates very forcibly the fact that the clinician and the surgeon are absolutely dependent on each other for the safe management of such cases. The greater the experience of the surgeon the more he realizes that there are many details in the treatment of surgical conditions which demand a training which he has not been able to acquire. Whatever may be our attitude toward high specialization, it is true that the important advances in medicine and surgery in the future will probably be made by those who have devoted their energies to a relatively narrow field. The results of the management of these cases of high intestinal stasis illustrate this fact. The former methods of treatment of these cases were partially successful, since by repeated gastric lavage and the administration of fluids, recovery often took place, but some of these patients died and we know now that some of those deaths were unnecessary. The method of early detection and treatment of these cases which Dr. McVicar has described has unquestionably saved the lives of patients who would have succumbed under former management.

The surgeon, of course, is particularly interested in those cases in which operation is anticipated or has already been carried out. In the preoperative management of cases with marked obstruction at the pylorus, whether from a benign or a malignant lesion, the surgeon has learned that operation can be carried out with much greater safety if preparation of the type just outlined has been made. The advantage in the treatment of a benign lesion is that the toxemia which is associated with the obstruction can be recognized and can be controlled by the intravenous injection of a 1 per cent sodium chloride solution and 10 per cent glucose solution. When the toxins have been

neutralized, as is shown in the decreased urea, carbon dioxide combining power, and in the increased chlorides, the patient can be operated on with a much greater measure of safety. Another advantage in the preoperative neutralization of toxemia is that the patient has become accustomed to the use of the stomach tube so that its postoperative use, whenever necessary, is not quite so discomforting as it would have been had the stomach not already been systematically lavaged. The advantage in the treatment of carcinoma with obstruction is even greater; for not only is the toxemia controlled, but in many cases it becomes possible to do a resection of the stomach in one stage in cases in which the risk of a one-stage operation was formerly found to be so high that it was necessary to relieve the obstruction first, and then remove the growth at a secondary operation.

The point to emphasize in this group of obstructed cases is that the responsibility of putting the patient in condition for operation should be assumed by the clinician and he should be closely associated with the surgeon in the postoperative care of the patient so that the operation itself is more or less of an incident in the management of the case. Not only should the clinician play a large part in the immediate supervision of such patients, but such supervision should be maintained in the subsequent convalescence, since the results of the treatment of peptic ulcer will be made much more certain by reason of it.

Finally, one would have no hesitation in saying that this method of management of these serious cases is a real advance in medicine, and it is a tribute to what can be accomplished by clinical investigation based on precise methods of examination in the laboratory and at the bedside. It is an example of the growing recognition of the value of proper co-operation between clinician and surgeon.

DR. E. L. TUOHY (Duluth): Are there any surgeons present? Since Dr. McVicar's article appeared in the *American Journal of Medical Sciences* we have been giving some attention to this very important matter. To an internist who delves intensively in diagnosis upon folks who have passed the fortieth and fiftieth year his responsibility can not be dropped when the patient enters the operating room. It is one thing for a surgeon to develop a reputation on operations about the pelvis and quite another to retain his reputation when he operates on the upper abdomen. The fearful things that happen, including lung complications, what is called acute dilatation of the stomach, postoperative ileus, truly mark a train of ruin. Anything that comes along that tends to obviate many of those difficulties should be listened to very attentively.

Only in the last number of the *A. M. A. Journal* appears a short article dealing with a simple method of overcoming vomiting, and it is this: The giving of copious draughts of two per cent salt solution. Now this brings up a flood of experiences that would be too long to enumerate and would get us nowhere, but several things come to my mind. There are not a few migrainers who have gotten relief from the drinking of salt water. Usually they take it in order to encourage vomiting. Anything that will keep the peristaltic gradient normal according to Alvarez is soothing to the patient. The quietude of the musculature about

incisions is very vital to the comfort of the patient, whether the operation be intra-abdominal or otherwise. It is odd how many patients operated on for hernia under a local anesthetic have severe postoperative nausea.

Not a few young girls with anemia are prone to have regurgitation of food or vomiting. I long ago learned that they didn't need detailed examination with the stomach tube, but most of them got well promptly if given a little hydrochloric acid. They need chlorides. So, also, we learned that obstruction of the bowel was frequently associated with severe toxic states, anuria, and uremia with a piling up of the urea nitrogen in the blood.

We are indebted to Dr. McVicar for bringing this out and most particularly for showing us the accurate laboratory methods of diagnosis, because it is true that many of these patients have been treated on a basis of acidosis when they really have an alkalosis. I have seen tetany follow the continued administration of alkalies for duodenal ulcer. That they have some of the appearances of an acidosis is correct enough, but, in truth, they are suffering from alkalosis. I have not seen, in my own practice, tetany occurring after high obstruction.

Certain it is that doctors routinely make a great mistake in sending their patients into hospitals for operation, late in the evening, the night before they are operated. That is an absurdity that each one of us should make up our minds to change at once. Too often the doctors are afraid that if the patient stays in the hospital one day before operation he may change his mind and go home.

DR. C. S. McVICAR (closing): I am sure we are all interested in any early signs apart from blood chemistry studies which may hint at the development of this condition. Suggestive points for observation are indicated in the headings of the tables. If a patient is not getting along well postoperatively, an accurate daily summary is made of the intake of fluids and also of the output. Emesis should be measured as well as the amount recovered by lavage. The amount of proctoclysis expelled cannot be measured, but may be estimated. Blood pressure readings are significant. The signs suggesting the development of toxemia are a falling blood pressure, a falling urinary output, and a negative fluid balance; these are the clinical danger signs. The accurate estimation of the toxemia depends on blood chemistry studies. The mortality in severe cases is sufficiently great to warrant accurate blood chemistry studies.

I was glad that Doctor Balfour discussed the question of lavage, or at least gave an opportunity of referring to it again. The reason for the drop in chlorids has been an interesting matter for speculation. Of course, the loss of hydrochloric acid by vomiting would explain it, provided the vomiting were a constant feature. But we have had an opportunity of seeing quite a marked drop in chlorids with a high urea and high CO₂ in patients who didn't vomit, and there are some experimental data supporting this clinical experience. Vomiting is not a complete explanation for the chlorid drop.

Throughout the years, these toxemic patients have been treated on the hypothesis that the retained secretion was toxic and that if it was continually removed the patient would get well. Now, undoubtedly, patients do get well spontaneously, but whether they get well because of lavage or in spite of it is a question. The fact that the fluid removed contains a good deal of water and that it contains chlorids makes it seem quite worth while to leave it there. Lavage has to be practiced, however, in order to get accurate diagnostic data. If the total accumulation of fluid in the stomach, by its gross weight, embarrasses motor function in the gastrointestinal tract it should be removed. Gross gastric retention may also threaten a suture line.

There is one other point to emphasize,—Dr. Tuohy just touched on it,—and that is, that the diagnosis of an acidosis is probably often made when it is not actually present. The only accurate way of doing it is by an estimation of the alkali reserve of the blood by getting the carbon dioxide combining power or by the PH of the blood. Kast, Myers and Schmitz called attention to the fact, which has since been confirmed, that ketone bodies may be excreted in the urine of a patient who has actually an alkalosis, so that the presence of acetone bodies in the urine is not necessarily evidence of acidosis. This has an important practical bearing because it may mean that the finding of acetone bodies in the urine in this toxemia might lead to the therapeutic use of alkalis, which are definitely contra-indicated.

We believe the toxemia present in these conditions can be controlled in spite of the obstruction, and that the operation necessary to remove the obstruction is consequently much more safely undertaken, and that in the post-operative ileus with this toxemia the evidence which made one suspect or be afraid of obstruction disappears with relief from toxemia so that the operations are not necessary.

THE PROFANE USES OF SCIENCE

Since that historic day when Dr. Samuel Johnson paralyzed the abusive fishwives of Billingsgate with the mathematical oburgation of "Rectangular parallepipeds," science has progressed a great deal. There are now several brand-new sciences whose abusive possibilities had never yet been explored until Sir Henry Hadow, the dignified Vice-Chancellor of Sheffield University, revealed them at the last annual Conference of the Royal Microscopical Society, a serious scientific body not ordinarily given to persiflage. One of the learned papers dealt with that sprightly little creature, the neutrophil polymorphonuclear leucocyte.

Then up spoke Sir Henry and said he:

There can be no doubt to the lay mind what that phrase means.

It means that on all occasions of public controversy a man who is white-blooded and distressed in an unduly bewildering diversity of opinions is beloved by neither side.

I have hitherto thought and wanted to call him a muggump, and have refrained from doing so because that is not a word of academic dignity, but in future I shall know exactly how to deal with him. I shall call him a neutrophil polymorphonuclear leucocyte, and if that does not bring him to terms I shall regard him as beyond argument.—*The Living Age*.

SURGERY IN THE DIABETIC *

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The older surgeons will remember that a very few years ago the common teaching was that diabetic patients were extremely bad surgical risks. Our students were taught that no surgery should be undertaken upon diabetics except that which was lifesaving. The pendulum now swings to the other extreme: a better understanding of the disease, of proper regime, proper feeding, and most important of all the recent introduction of insulin, have placed these patients almost in a class with a non-diabetic individual. We all remember how a decade ago the mortality rate following operations upon diabetics ran all the way up from 30 to 50 per cent. Even at the present time in diabetics who are obliged to undergo emergency operations the mortality is still high. The reason for this of course is due to the fact that these patients have not been under diabetic treatment prior to that emergency and because of the urgency there has not been time to give them adequate and proper diabetic treatment before operation.

The results in surgery obtained by the modern method of treatment of diabetics are well expressed by the low mortality reported at Rochester in 327 operations performed from October 1, 1921, to October 1, 1923. The mortality percentage for all of these operations was only 1.2 per cent. Of these operations 141 were those of major surgery. This mortality rate compares favorably with that following general surgical procedures in patients who are not diabetic.

We believe that all diabetics should be under the careful, constant care of a competent medical man. We believe this is especially important if any surgery is contemplated, and we believe that it is this factor of careful observation and treatment, which of course includes the use of insulin, which makes it possible for us to do formal surgery upon these unfortunate patients with little if any added surgical risk. While it is sometimes impossible in emergency surgery to properly study, treat and prepare these patients for that surgery, yet at least we can generally see that they are given plenty of fluids and that their carbohy-

drate reserve is built up even for a brief period prior to surgery. While we are convinced that preliminary medical treatment is necessary in these cases, we also believe that these patients should be carried through the operative and post-operative period under the same constant care of the internist; in other words, there must be the closest co-operation between the medical man and the surgeon to tide these patients over their crises.

There are many conditions that call for surgical intervention in diabetics just as in other patients, whether the surgery is either of election or necessity. The prevalence of carbuncles in the diabetic is thoroughly understood and I believe adequately treated. Joslin holds that gallstones in the diabetic should be removed, affirming that the risk of surgery is less than the danger from the stones themselves.

Among the many phases of surgery in the diabetic there is one I wish to stress particularly, namely, gangrene of the lower extremities. This diabetic gangrene usually occurs in people of later life, ordinarily over fifty. We know that arteriosclerosis is a constant accompaniment of this condition. The obliteration of the arteries of the leg due to endarteritis obliterans or to the formation of thrombi, cuts off the blood supply of that extremity. The presence and extent of the gangrene depend upon the competency of the collateral circulation. This gangrene may be of the senile or dry type with a definite line of demarcation. It is much more liable, however, to be of the moist, spreading type with no line of demarcation but with inflammation and edema of the tissues and with marked constitutional symptoms. In the first type, the dry or senile gangrene, it is sometimes possible to defer operative interference. Nature herself has been known to amputate the toes of these extremities and if there is no tendency to acidosis, operative interference is not immediately indicated. The use of insulin and proper dietetic regime has occasionally been known to obviate the necessity of surgery, other than the picking off of the dead toes. It is in the moist type, however, where we have constitutional symptoms from infection, that the patient's life is immediately put in danger and operative interference is indicated. It is generally accepted by the surgeons of the world that amputation in this type of gangrene is indicated, and amputation is not only indicated but should be made high or above the condyles

*Presented before the annual meeting of the Minnesota State Medical Association, Minneapolis, April, 1925.

of the femur. Moschcowitz's test, while not absolutely conclusive, gives us evidence of very considerable value as to the condition of the circulation of the extremity involved. X-rays taken of the lower extremities of these patients practically always show distinctly the arteries which have undergone atheromatous or calcareous degeneration.

Experience shows that amputation below the knee or at the knee is frequently followed by sloughing of the flaps and by infection, which is secondary to the insufficient blood supply to the tissues. This necessitates reamputation with its added mortality. Therefore it is generally postulated that when amputation is advised, it should be above the condyles of the femur. We personally have records of fifteen lower thigh amputations for diabetic gangrene with but two deaths. After amputation a dissection was made of the extremity and in every instance the femoral artery was found to be obliterated or thrombosed and the circulation was cared for in that extremity by the profunda and collateral circulation alone.

We believe there are certain factors in surgery which make it possible to perform these amputations with a low mortality rate. First, preliminary medical treatment to provide for an adequate carbohydrate reserve to combat the tendency to acidosis and to get the urine sugar-free if possible. Second, the anesthetic. Personally we prefer the blocking of the anterior crural and the great sciatic nerves with novocaine and then the use of nitrous oxide and oxygen analgesia, in preference to ether. There are surgeons who feel that a small amount of ether does not increase the risk to these diabetics. We are prepared to admit that in order to obtain proper relaxation of the abdominal wall which we cannot obtain with local anesthesia, nitrous oxide or ethylene, we must have recourse to ether. We do know, however, that prolonged inhalation of ether increases and invites acidosis. We are convinced that whatever anesthetic is used its exhibition should be extremely brief and that

none of these patients should be subjected to prolonged operative interference. In the case of gangrene of the lower extremity, the so-called battlefield transfexion amputation of the thigh with anterior and posterior musculocutaneous flaps can be done in less than a minute. A few silkworm sutures and a drain take but a few moments to apply. More extensive or prolonged manipulations should not be resorted to. Delicate handling of the tissues is imperative because of their lowered resistance and their predisposition to infection because of the diabetes. Hemorrhage as a rule is slight and can be anticipated and controlled by the pressure of an assistant's fingers upon the femoral artery. We believe this is preferable to the application of a tourniquet because where there is already a tendency to disease and occlusion of the vessel, injury by the pressure of the tourniquet will increase the danger of thrombosis. If it is necessary to use a tourniquet at all this tourniquet should consist of a three-inch elastic Martin bandage applied over the breadth of a folded towel over the limb so that the pressure will be distributed over as wide an area as possible.

In conclusion we believe that diabetics can be tided over the crises of surgery by proper preliminary medical treatment which should be carried through the preoperative and postoperative period. We believe any operation undertaken should be done as rapidly as is possible. We believe the anesthetic should be brief and should if possible consist of local anesthesia with nitrous oxide and oxygen analgesia, in preference to ether. We believe the tourniquet should either not be used at all, or, if necessary, should be a wide one and left on for as short a period of time as possible. We believe that a minimum of manipulation or handling of tissues should be resorted to. We also believe that if these precepts will be followed the risk following operations upon the diabetic will be little greater than that incurred in operating upon patients who do not have an excess of sugar in their urine or blood.

COMPATIBILITY OF QUININ AND ACETYLSALICYLIC ACID

It has been shown that long continued heating of some of the cinchona alkaloids, particularly quinin, with weak organic acids caused the formation of an isomer, erroneously called "quinotoxin," but more properly named quiniacin. These isomers were reported to be quite poisonous.

However, Sollmann reviewed the question and concluded that there is no occasion to fear toxic effects from the transformation of quinin into "quinotoxin" and that this substance is not especially toxic in the quantities that might be formed in the body. Mixtures of quinin and acetylsalicylic acid decompose slowly, but they do not become appreciably toxic. (*Jour. A. M. A., Apr. 4, 1925, p. 1070.*)

TREATMENT OF GANGRENE IN ARTERIOSCLEROTIC DIABETES*

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In this short paper it is impossible to cover the entire field of surgery in diabetes, and I have therefore decided to limit myself to arteriosclerotic gangrene. Diabetic gangrene should not be classified as a distinct form, inasmuch as the pathology is the same as in straight arteriosclerosis. The pathological picture is the result of extensive arterial obliteration. The diabetes may give it a different picture at times, but we must not lose sight of the primary cause. Diabetic gangrene usually is the result of superimposed hyperglycemia allowing the infection to spread more easily. Originally this type usually accompanied ulcers of a trophic disorder, and as a result moist gangrene develops. Dry gangrene is the result of atheromatous changes of the vessels, without infection, and is due to impaired circulation.

Pathologically the picture is just the same in arteriosclerotic and diabetic gangrene. Extensive degeneration of the arterial walls with calcification and bone formation occludes the entire vessel. The arteries become rigid as pipe stems, and in places atherosclerosis with dilatation of the vessels, ending in thrombosis, may be found. Large areas of clot formation may be present. In the end this gives impaired nutrition, and it is not to be wondered that gangrene occurs. Therefore inadequacy of circulation may be in various stages of development. As a result, no definite objective phenomena of vascular obliteration may be found. But in the end, the presence of metabolic deficiencies due to diabetes is sufficient to lead to gangrene upon the mere action of a trifling trauma. The dorsalis pedis and popliteal arteries still may pulsate, but due to small clots in a dilated artery with trauma, infection rapidly spreads up the thigh. Roentgenograms of the vessels may show a completely calcified vessel, or only a mass of atheromatous tissue along its course.

Extensive inflammation in diabetic cases usually is associated with gangrene of the skin. A small

area of infection, usually near the base of the toes, is the point of entry. At times redness, tenderness, and pain may be the only symptoms, and still the deep tissues show extensive involvement. Some invasion of the plantar and dorsal tissue follows, and we find the deep structures invaded before the skin is attacked. Tendons, fascia, and muscles undergo a sloughing, suppurative process.

In the University series, 95 per cent of our cases appear during the winter months. It seems probable that cold is a great factor, and this has been especially true of dry gangrene. Most of our cases, however, have been moist gangrene, and unfortunately have come to the hospital after extensive infection has occurred. The former type does not need so radical a treatment, and with the use of iletin and medical care, this type permits us to wait for tissue to be "plucked off" the extremity. Moist gangrene, however, usually means amputation, for, in the end, surgery has to be resorted to more frequently in this type than in the former. The diabetic cases under our care in the University Dispensary have shown surprisingly little gangrene. Where it has occurred, it has not been severe, and usually has been of an infectious character resulting from cutting corns. In no case has amputation of more than a toe been necessary.

Diabetic patients over the age of fifty, with marked general arteriosclerosis, are the ones usually attacked. According to Joslin, about 20 per cent of all patients over the age of seventy develop gangrene. In our series at the University Hospital, one out of every six below the age of fifty-seven has had gangrene in some form. It rarely occurs in the young diabetic, and is relatively rare below the age of fifty. In all of our cases it has involved the lower extremity, with the exception of one individual. This lady, aged thirty-seven, had an involvement of the little finger of her left hand, which subsequently cleared up under luetic treatment. The causes of gangrene appear slowly, and therefore generally give a long period of preceding symptoms. Some complain of attacks of intermittent claudication; others complain of burning of the feet and cold extremities. The event usually terminating this period is the result of trauma, either thermal or mechanical, as an abrasion, often careless rubbing and scratching, or a burn involving the skin. Again the pernicious habit of treating corns, calluses, etc., with a dirty knife or under septic conditions, may be the offending

*Presented before the annual meeting of the Minnesota State Medical Association, Minneapolis, April 29, 1925.

cause. The stage has been set for a long period of years, and for that reason prophylactic treatment is so essential in all diabetics.

Of course, under prophylactic care, the proper treatment of the diabetes per se is essential. Although we have no direct evidence, it seems that hyperglycemia may be a great offender in the development of arteriosclerosis, and for that reason it is hoped insulin will give us a smaller number of these cases in the future. Also cleanliness of the feet is often forgotten. As Joslin has said, "It is best that a diabetic patient over fifty years of age should bathe his feet as carefully as his face if he wishes to avoid gangrene." The point is to keep away from infected abrasions of the feet if possible. Corns and toe nails should be cut only after cleansing of the parts involved, and under aseptic conditions, with clean instruments, and under bright light. The danger of strong irritants, of iodine especially, should be impressed upon these people. Great care should be used in choosing new shoes, and in avoiding the type that will pinch the feet. Efforts to maintain good circulation of the feet should be considered. Gymnastic exercise to increase the circulation should be used daily. These patients should not walk long distances; they should not allow their feet to remain in one position for a long period; nor should they sit with their legs crossed. Circular garters of any kind should not be used. Hot foot baths and massage should be encouraged. Passive hyperemia is dangerous, and any injury to the skin should be reported to the physician at once. Buerger's passive exercises can be recommended here rather than after gangrene has developed. Some physicians feel that metal arch supports are dangerous, but we have never seen any injury from them in the University series. Nevertheless, they are to be warned against. Minute detail, apparently foolish on first thought, can always be carried out better before gangrene has developed. A tourniquet should never be used by the surgeon at the time of operation. I am sure that this has been the offender in two cases in our series this year at the University Hospital. As a result, the flaps, even though taken from the thigh surface, necrosed in two days after operation. In each case, the tourniquet had been applied for about thirty to sixty minutes.

Joslin's rules for the treatment of the feet in diabetes cannot be impressed too carefully upon the physician or the patient. They are as follows:

GENERAL HYGIENE

1. Wash the feet daily with soap and water. Dry them thoroughly, especially between the toes.
2. When the feet are thoroughly dry, rub them well with hydrous lanolin, as often as is necessary to keep the skin soft, supple, and free from scales and dryness. If the nails are brittle and dry, soften them by soaking them in warm water a half hour each night and apply lanolin generously under and about the nails. Then bandage the feet loosely. The nails should be cleaned with orangewood sticks. Cut the nails straight across, and avoid injury to the toes.
3. Wear shoes which do not bind or rub. Wear new shoes one-half hour only on the first day, and increase one hour daily.

TREATMENT OF ABRASIONS

1. In the diabetic, insignificant injuries may result very seriously, therefore proper first-aid treatment of any abrasion is of the utmost importance.
2. Thorough cleanliness with soap and water is necessary.
3. Strong, irritating antiseptics such as sulphonaphthol and iodine are to be avoided.
4. The lesion should be covered with lanolin on sterile gauze under a slight bandage. Sterile gauze in small packages can be purchased at drug stores. Avoid using the foot as much as possible until the wound is healed.
5. The patient must consult a doctor for any infection.

TREATMENT OF CORNS AND CALLOSITIES

1. Wear shoes which cause no pressure.
2. Soak the affected foot in warm, soapy water. Dry and rub off or file off any dead skin. Then paint the corn with the following mixture: Salicylic acid, 1 dram; collodion, 1 ounce. Repeat the procedure for four nights; then, after soaking the foot in warm water, the corn will come off easily.
3. Do not cut corns or callosities.
4. Wear a pad to distribute pressure, if necessary.

CIRCULATORY AIDS

1. Prescribed exercise.
2. Avoid sudden changes in temperature.
3. If the feet are subject to chilblains, wash them daily in warm water, dry them carefully, and powder them lightly with borated talcum powder. Wear woolen stockings and avoid extremes of temperature.
4. Massage with lanolin.
5. Buerger's gravity-hyperemia method for bed-patients.

CONDITIONS REQUIRING ATTENTION IN DIABETIC FEET

1. Cold feet.
2. Dry, scaling, atrophic skin.
3. Thick, dry, brittle nails.
4. Corns and callosities.
5. Cramps.
6. Stiff or limited joints.
7. Discoloration with red or bluish areas.
8. Clammy, moist skin.

Various drugs have been suggested in the treatment of dry gangrene. Citrate introduced into the circulation has been used by some men. In our early series, it gave no relief. Thyroid extract has been suggested with the idea that it will "whip up" the circulation by giving increased activity of the heart. Both drugs seem rather ineffective, but might be tried at times. Subcutaneous injections of sodium nitrite in order to dilate the vessels seem more rational, and have given some improvement in cases where slight dry gangrene of the toe has occurred. The heart must be watched, and if there is evidence of myocarditis and muscular weakness, digitalis will help to increase the peripheral circulation. As a rule, nitrites and digitalis are the drugs to be recommended.

Methods to improve the circulation should be used in medical treatment, but are not applicable to all cases. Buerger's postural treatment is best. It gives greater help in cases where extensive phlegmon and extensive gangrene have not occurred. The treatment induces rubor and accelerates circulation. The treatment is as follows:

1. Elevate the extremity until a blanching of the foot has occurred. This requires a half to three minutes, depending upon the degree of circulatory impairment.

2. Hang the leg over the bed until distinct redness has developed. Usually this takes from one to two minutes. If pain develops, make both periods a shorter time.

3. Then allow the leg to be placed on the bed for a rest. This period may vary from three to five minutes. In general, a half to one hour completes this treatment, and then heat in some form should be applied, gradually in trophic disorders. The temperature should be slowly elevated to 125° F., and raised to no higher than 220°, great care being taken not to burn the patient. If extensive moist gangrene has developed, we are apt to do greater harm at this time. Heat is applied with each postural exercise. From two to six treatments a day should be given in the ideal cases.

The application of heat by special lamps is best. An electrical basket covered with flannel has been used in our cases. However, any hot air apparatus may be recommended, as electric lamp, electric pad, or diathermic apparatus.

Between periods of treatment, especially in dry gangrene, no bandages need be applied if a cradle

is put over the feet, and the bedclothes allowed to cover the extremities. This is also desirable for it does not allow the weight of the bedclothes to impair circulation.

After a definite gangrene has occurred, with or without infection, we then have a different condition to deal with. The damage has now been done. It is a question of how much can be saved out of the fire, and when the fire will spread. We now have to deal with a general systemic condition. The heart and especially the kidneys have to be considered in addition to our local conditions. Will the kidneys be able to excrete properly, with infectious metabolic processes injuring the kidney structure? We have to treat not only the diabetes, but uremia and acidosis as well. The heart muscle may be damaged by the toxic absorption of necrotic and infectious material, and in the end we may even have to deal with a bacterial infection of the blood stream. Therefore the first consideration in treatment is dietetic, with the proper amount of carbohydrates to allow the burning of the fatty acid radicals, and only sufficient protein to allow nitrogenous equilibrium. The closest co-operation between the physician and surgeon must be followed. Iletin has been a great help in combating the infection by reduction of hyperglycemia. It will allow us to get the patient ready for operation, if necessary, at an earlier date, and therefore it will prevent acidosis and uremia from occurring, before surgical intervention. The glycosuria is usually easily controlled.

A specimen removed at operation convinces one of the uselessness of delaying operation in some cases. We may regret that the limb was not removed earlier. Here x-ray will help reach a conclusion as to the condition of the arteries and the involvement of necrotic bone. At times it also helps to decide the site of amputation.

Undoubtedly we have been unfortunate in seeing the bad rather than the mild cases in the University series. Months in bed, with intense pain and suffering, is usually the history before entrance to the hospital. Add to this, foul smelling surroundings, with high temperature and sepsis, and you see the infection and gangrene sweeping over the extremity in a short time. Oftentimes amputation has been delayed so long that it is useless to attempt removal, and in justice to the surgeon, death should not be attributed to him so much as

to the physician's delay in reaching a definite decision.

This brings up the question of the time to operate. As a rule, with dry gangrene which is becoming localized, we can defer operation and watch events. However, moist gangrene may occur overnight. Remember that you cannot save dead tissue, and, at the best, you have to wait months for the sloughing and dropping off of the involved area. In other words, do not wait too long before surgical interference. Severe pain and rapidly spreading moist gangrene are always definite criteria for operation. We do not intend to recommend radical surgery in all cases.

The surgical treatment of the gangrene we will leave to the surgeon. In general, also, the choice of the site of amputation is left to him. Remember that we have a better collateral circulation above the knee than below, but absence of a popliteal pulse may not be a contraindication for low removal. At any rate, the amputation should be high enough to get away from the localized infection and allow enough healthy tissue for a flap, with good circulation. If healthy tissues are found, we are in a better condition to close the area without drainage. Personally, we have found better results above the knee, and there is a better chance for the adjustment of an artificial leg.

Also the choice of an anesthetic may seem a minor detail. But we are dealing with minor details which may make a decided change in post-operative care. If possible, local and spinal anesthetics are the methods of choice. Our experience with ether has not been as successful as with gas and oxygen. However, the Mayo Clinic uses it with good results. Without entering into the discussion of the choice of gas or ether, let us do as rapid an operation as possible to avoid more opera-

tive damage than is necessary. As a rule, our cases in the University Hospital receive gas and oxygen as long as possible, and ether is resorted to later if necessary. In that way, only a small amount of ether has been used. Most of our fatal cases have had ether, but that does not mean that ether has been entirely the cause of death, for uremia, lack of kidney excretion, and cardiac failure have entered into some of these statistics.

CONCLUSION

Gangrene would seldom occur if the patient would take as good care of his feet as of his face.

Prophylactic care for all patients over the age of fifty should be taught.

Death from gangrene today is usually due to the inability of the physician and patient to make a definite decision.

Surgery often receives the blame for fatal cases, but as a rule the physician is at fault.

In the past, ether anesthesia and error in diet have been greatly responsible for the fatal outcome. Today, with the help of insulin, and proper medical and surgical supervision, we should have better results.

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Sun and Moon Oil and Ointment.—Alfred W. Lowrie, of Hartford, Conn., an alleged divine healer, mixes religion with his quackery. In a publication by him he is said to have died once, and while dead was ushered into the presence of the Supreme Being. While in heaven, Lowrie was presented with the "key to knowledge," to be used by him when he returned to earth. After Lowrie's visit to heaven, he seems to have started making what he is pleased to call "Sun and Moon Sacred Ointment" and "Sun and Moon Sacred Anointing Oil." The ointment is claimed to contain "vibrations of life from the radio-activity of electricity, magnetism, electrons and atoms." The ointment is to be used externally and internally for a variety of ailments. The A. M. A.

Chemical Laboratory found the composition of the ointment to be essentially: petrolatum 75.50 per cent, saponifiable fat 17.20 per cent, methyl salicylate 4.00 per cent, "dirt" 0.15 per cent, oil of sassafras, water and undetermined 3.15 per cent. The "sacred oil" is for external and internal use. It was claimed to have no equal for tired and sore feet, rheumatism, neuritis, lameness, hardening of the arteries and nerves, broken bones, skin diseases and other conditions. The A. M. A. Chemical Laboratory found the oil to consist essentially of fixed oil (probably olive oil) 87 per cent, methyl salicylate 5 per cent, oil of sassafras 1 per cent, alcohol 2 per cent, water and vegetable extractive 5 per cent. (Jour. A. M. A., Aug. 9, 1924, p. 458.)

COMPRESSION THERAPY IN PULMONARY TUBERCULOSIS*

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Nopeming

Rest of the diseased part promotes the healing of tuberculosis in every location. General rest, that is, bodily rest in bed, is always valuable in treating active tuberculosis whatever additional means for securing local rest are indicated. In many cases of pulmonary tuberculosis bed rest alone is all that is needed if used in association with fresh air and proper regimen. It lessens to a considerable degree the work demanded of the diseased lung and so promotes healing. To secure results this rest must be consistently and religiously maintained until the disease is quiescent. It can be made slightly more effective by posture and various external appliances.

The unyielding bony wall of the thorax prevents us from putting the lung completely at rest by external pressure without surgical intervention. In a certain number of well advanced cases it is now apparently proven that the patient's prospects are better with such intervention than without it.

It is generally recognized that we have a larger lung capacity than we can use under ordinary conditions and that we rarely need the reserve. Observations upon patients with chronic chest effusions or suffering from spontaneous pneumothorax demonstrate that a person can get along very comfortably with one lung out of commission.

It has been noted that in some cases the tuberculous lesions present in the compressed lungs cease to be active and heal. It has thus become evident that a tuberculous lung can be placed at rest almost as effectively as a splinted tuberculous joint. Ordinary bed rest quiets respiration but does not protect the lung against the violent movements on coughing. By compression, the lung is immobilized at its root and is reduced in volume not only by the pressure of the gas but also by the retraction of its own elastic tissue. The walls of cavities are brought in apposition, the lung is emptied of its contents like a sponge and its inflammatory exudates are squeezed out into the bronchi and removed. A blood and lymph stasis results so that the absorption of toxins and the dissemination of tubercle

bacilli to other parts of the body are reduced. The formation of connective tissue is stimulated and eventually the tuberculous lesions may all be encapsulated and healed. These favorable effects are especially apt to be seen where the disease is already definitely of a proliferative or fibrous character. If there is no disease in the other lung, it remains healthy but the behavior of slight lesions or those of moderate extent in the opposite lung varies. They may be excited to increased activity on account of the additional work placed on that lung or they may also heal as a result of the increase in the general bodily wellbeing and resistance to the infection.

Two forms of surgical compression are now widely used in selected cases: artificial pneumothorax and paravertebral thoracoplasty. Pneumolysis and phrenicotomy are sometimes used as supplementary procedures.

Artificial Pneumothorax.—This operation was first performed by Forlanini, an Italian, in 1892. John B. Murphy, without being aware of Forlanini's work, attempted the same procedure in 1898. It is doubtful if the method would have ever been used extensively if the development of the x-ray had not made possible the more accurate knowledge of the state of affairs within the chest, which is absolutely necessary for the safe practice of artificial pneumothorax. Without such help it would be a dangerous method of treatment.

As artificial pneumothorax is performed today a hollow needle is inserted through the chest wall in a space between two ribs. This needle has two connections, one going to a gauge or manometer and one to a bottle of air under pressure. The manometer is most important. When the needle is in the pleural space it registers a negative pressure which rises and falls with respiration. If this does not happen the needle is not in the free pleural space and no air should be admitted. If it does, air may be admitted gradually to the amount of 200 or 300 c.c., the condition of the patient and the manometer being watched carefully meanwhile.

On the following day the procedure is repeated and after a fair amount of compression is secured the intervals between refills are less frequent and larger amounts are introduced.

In some cases on account of adhesions no air can be introduced; in others only small amounts. The best results are obtained in those cases where a considerable degree of compression can be se-

*Read before the St. Louis County Medical Society, Duluth, May 14, 1925.

cured although a partial compression is sometimes followed by some improvement in the patient's condition. If air is not reintroduced, that already present is absorbed and within a few weeks the lung will reexpand and probably become more and more adherent to the chest wall. To maintain the pressure many periodic repetitions of the initial procedure must follow through a long period of months and years.

Thoracoplasty.—The removal of portions of several ribs to permit the bony walls of the thorax to collapse and the pressure of the external air to be transmitted to the lungs is not a new operation. In the original Estlander operation for empyema, which involved the removal of ribs, the intercostal muscles and the parietal pleura were not removed. In his later operation which when extensive was very similar to Schede's operation there was complete removal of the ribs, intercostal structures and parietal pleura, so that the superficial muscular and cutaneous flap was brought right in contact with the visceral pleural layer. The incision in Schede's operation begins over the costal cartilage of the second rib, passes downward along the cartilages to the tenth, along the upper border of the tenth and then upward along the vertebral border to the second interspace. The operation is one of the severest in surgery and is not used to produce lung compression in pulmonary tuberculosis.

Friedrich⁴ of Marburg used a similar incision but in place of removing the principal structures of the chest wall, removed only the ribs by subperiosteal resection, leaving the periosteum and the intercostal muscles uninjured. His idea was to produce a complete collapse of the lung by deossification. All of the ribs from the first to the tenth were removed. To this procedure he gave the name "Total pleuropneumolysis." He was led to employ this procedure after observing its beneficial effect upon the lung lesion in a case of advanced tuberculous osteomyelitis. Brauer, his colleague, then urged him to operate on a number of cases of unilateral tuberculosis in which the production of an artificial pneumothorax by operation was impossible on account of adhesions. The first operation was done in December, 1907, upon a Belgian. This complete Friedrich-Brauer thoracoplasty is associated with a very high mortality and with considerable shock and chest deformity. Some of the alarming sequelæ persisting for several days have been marked dyspnea and air hunger, paradoxical breathing and

pendulum air due to loss of bony support, mediastinal flutter and cardiac embarrassment from unsupported heart, sputum retention, aspiration dangers and pulmonary edema.

The Wilms operation of "columnar resection" was less formidable than the Friedrich-Brauer operation, but produced comparatively little collapse of the lung. It consisted in the resection of short pieces of the ribs at the costo-vertebral angle combined with the resection of short fragments of the costal cartilages. It was used somewhat extensively in Europe from 1911 to 1914. The immediate mortality was nil.

The Sauerbruch operation, which was really a modification of Wilms and consisted of a "posterior" or "paravertebral resection" of longer portions of all the ribs or of a limited number according to the extent of the disease and the condition of the patient, was first practiced by Sauerbruch in 1912.

This operation or modifications of it has been used quite extensively both in Europe and America. Sauerbruch resected four to eight centimeters from each of the ribs subperiosteally from the first to the eleventh at one or more sittings, and, like Wilms, took advantage of the fact that removal of those parts of the ribs posterior to their angles is essential for satisfactory compression.

The skin incision of the original operation runs from the level of the second rib vertically downward, in the paravertebral line and bends forward along the tenth rib. The muscles are cut through in the direction of the incision, so that the scapula at its posterior border is freed, and can be bent forward upon its anterior edge. The ribs are now resected from below upward, beginning with the tenth or eleventh, to the extent of 10 cm. below and 4 or 5 cm. above. The decision as to how many ribs are to be removed in the first sitting depends upon the condition of the patient during operation.

Pneumolysis is the separation of a lung or a part of a lung together with both its visceral and parietal pleura from the ribs and chest wall. The space created by the separation may be filled with muscle or fat tissue grafts or various tampons. It is used to supplement thoracoplasty by securing more effective compression of cavities and lesions at the apex of the lung.

Phrenicotomy or resection of the phrenic nerve causes paralysis of one-half the diaphragm and

permitting it to rise 1 to 3 inches higher in the chest is sometimes used in connection with both artificial pneumothorax and thoracoplasty.

Selection of Cases.—The number of patients whose lung involvement is sufficiently unilateral to warrant compression is variously estimated at between 2 and 10 per cent. At the Trudeau Sanatorium at Saranac Lake, of 209 patients discharged in 1924 nine, or 4.3 per cent, were treated by artificial pneumothorax. During the same period, of 409 patients treated at Nopeming 35, or 8.2 per cent, were given the same treatment. At the Manitoba Sanatorium one of us observed a still larger percentage (18 per cent) treated by this method. In both of the latter institutions there is a larger proportion of advanced cases than at Trudeau. In only a part of the cases in which it is advisable to attempt the treatment can satisfactory compression be secured.

The ideal case for compression is one of unilateral pulmonary tuberculosis in which the lesion is relatively far advanced, or advancing rapidly with softening and cavity formation, accompanied with marked toxemia. The lesion should preferably be at the apex and the lower part of the lung should be free from adhesions. In some such cases spectacular results which may be permanent can be secured. Adhesions, however, frequently interfere with the securing of satisfactory collapse and the attempt to produce it by pneumothorax will in many cases be unsuccessful. If after repeated trials satisfactory compression is found to be unattainable by pneumothorax it may still be possible to produce it by thoracoplasty. If the lesion is unilateral and early, still in the stage of infiltration, not progressing and apparently responding to the usual methods of treatment it is not worth while or desirable to attempt to compress the lung by any method. Sufficient rest to secure healing can be secured without risk by limiting the patient's exercise.

Few internists today recommend any attempts at compression until the patient has taken treatment for months and steadily lost ground. Excellent results are often secured by conservative methods. The progress of the case should be closely followed with the assistance of the x-ray so that a case that could be benefited by compression may not lose its chance of cure through neglect to apply compression. Artificial pneumothorax is also

sometimes indicated as an emergency measure to control hemorrhage.

In cases of unilateral tuberculosis where the disease is extensive and far advanced it may be advisable to select thoracoplasty at once as the method for securing collapse, though most writers recommend that artificial pneumothorax should have been attempted before the more radical procedure is tried.

The presence of a moderate lesion on the other side is not necessarily an absolute contraindication to either method of compression providing these foci appear to be inactive and limited in extent. This conclusion should be verified by x-ray study. With thoracoplasty the risk of stirring up trouble in the opposite lung by sudden throwing of extra work upon it is greater than in the gradually increasing demand which occurs with artificial pneumothorax.

The presence of a slight degree of laryngeal or intestinal involvement is also not a positive contraindication. Better results are now being obtained in the treatment of such lesions early in their course, but an advanced stage of the disease in either location would be a valid reason for not attempting collapse therapy.

Complications.—Various accidents and complications may arise during the course of compression treatment by artificial pneumothorax. These may occur at the time of operation or immediately after or later when the patient is up and about or even attending to business. Ordinarily the puncture of the parietal pleura by the needle for the purpose of introducing air is accompanied by no more shock than occurs when the chest is tapped for the removal of fluid. In both instances so-called pleural shock or pleural eclampsia may occur and be immediately fatal. This is, however, a rare occurrence as is gas embolism, which may also be fatal. Puncture of the lung does not necessarily result in serious consequences, but may be followed by hemorrhage or infection. Rupture of the lung may result from excessive air pressure especially in attempts to break down adhesions and be followed by a broncho-pleural fistula and empyema. Subcutaneous emphysema is of little significance but subfascial emphysema may cause considerable discomfort. The most frequent and serious complication is the occurrence of pleural effusion, which is said to occur in 50 per cent of cases. If it remains serous it is not withdrawn, as it helps to maintain

the compression. A copious effusion is, however, a serious complication and likely to result in the formation of adhesions which will necessitate discontinuance of the treatment. If the effusion becomes purulent, external fistulæ may result and in some cases radical surgical operations will be indicated.

In the case of thoracoplasty some surgical shock is to be expected though it is surprising how satisfactorily sick tuberculous persons stand the operation. There may, however, be serious respiratory and circulatory distress and occasionally mediastinal flutter. During the first few days a "flare up" of tuberculous lesions elsewhere is possible and the patients may be quite toxic. Severe pain may result from dragging of the brachial plexus or involvement of intercostal nerves in tears.

Comparison of the two methods shows certain advantages and disadvantages of each. The present practice, and it is almost general, is not to use thoracoplasty until after attempts to secure satisfactory compression by pneumothorax have proved unsuccessful.

The induction of artificial pneumothorax is not accompanied by as much shock as thoracoplasty and does not produce much deformity. The compression is secured gradually, there is less danger of lighting up foci of disease in the opposite lung, and if these do become active the treatment can be discontinued. The compressed lung may be allowed to re-expand, providing the compression is not of long standing and the lung and pleura have not become too much fibrosed. On the other hand, while the operation of artificial pneumothorax is a simple procedure, gas embolism and pleural shock are real dangers, serous effusions are frequent and in many cases are followed by the formation of adhesions or empyema. Spontaneous rupture of the lung may occur from the stretching of adhesions or the breaking down of cavity walls, and be followed by rapidly fatal pleural infection.

Ignorant patients deceived by the satisfactory immediate results frequently discontinue treatment against advice. Once the gas is absorbed and the lungs re-expanded, adhesions form which prevent the resumption of the treatment and thoracoplasty is the only resource left for compression. Artificial pneumothorax compression should be continued for at least a year or two and on the other hand should not be continued too long a period. It is very difficult to tell when it should be stopped. As the fibrosed lung re-expands, the encapsulated lesions

may be torn open and become active again. If left too long the compressed lung cannot re-expand at all and will be of no use. A large empty pleural space will be left to eventually fill with fluid which may become purulent and require eventual thoracoplasty.

Although the more radical procedure of thoracoplasty upon tuberculous persons is distinctly a major operation, the new technic has made it remarkably safe, especially when done in several stages. It is certainly safer than attempts to tear adhesions by pneumothorax. While thoracoplasty once done is beyond recall, when it is done it is finished and the patient does not have to look forward to repetition of the treatment for a long period accompanied by the possibility of various more or less serious complications. The immediate risks in thoracoplasty from shock, postoperative pneumonia, etc., are much greater, but the lasting results may be better than in pneumothorax. The amount of compression produced by thoracoplasty is somewhat less, perhaps two-thirds that produced by complete pneumothorax, but the clinical results do not appear to be less satisfactory on that account. Some surgeons believe thoracoplasty to be the preferable procedure in most cases though few have yet had the courage to put their theory into practice. The operative mortality of pneumothorax is less than 1 per cent, that of thoracoplasty 2 to 10 per cent. The former procedure is now used to some extent in most sanatoriums. Paravertebral thoracoplasty by Sauerbruch's method has been performed about a thousand times, mostly in Europe, and over a hundred operations have been reported in America.

Results.—These naturally vary with the care exercised in the selection of cases and the skill shown by operators and consultants in the conduct of the treatment. All observers agree that the preoperative treatment and the postoperative care are most important factors in success. Saugman believes that the operations should be done only at the sanatorium. Sauerbruch returns his patients to the sanatorium as soon as possible. Neither compression method should be used except in close co-operation with those who have had experience in the care of tuberculous patients.

Reports indicate that the final results of the two methods in suitable cases are about the same, that is, roughly, 35 per cent cured, 30 per cent improved, and 35 per cent uninfluenced.

The number of cases suitable for compression is

estimated by Alexander¹ and Fishberg³ from summaries of many reports as something under 5 per cent of all cases seen. Even at this low percentage Alexander estimates there are some 15,000 persons in the United States for whom surgical compression is indicated. Most of these are suffering from advanced disease and are doomed without it.

Collapse treatment has made it possible for men and women flat on their backs and suffering from severe toxemia to return to active life, to work and ask no favors from competitors, free from cough, free from expectoration, no longer disseminators of tubercle bacilli. If these men and women happen to be very much needed in the world by their families, the community or the nation, a continuation of their usefulness for a few or many years, as the case may be, is valuable public service.

The hazards and dangers are great enough so that compression therapy should never be undertaken lightly. It will always need expert hands and trained judgment. The technic of the operation of pneumothorax is so simple that any physician might learn it, but the risks during the long continued treatment are such that it ought never to be attempted except in association with trained tuberculosis workers. Any skilled surgeon with wide experience can do a thoracoplasty operation, but he would be unwise to attempt the management of a case demanding it without the co-operation of an internist with special training.

With these considerations in mind and under the conditions specified the risks are not so great that the treatment should be ever omitted in suitable cases. Compression has become so safe that the risks involved in not using it when indicated are not to be compared with the danger to the patient from the disease if it is not employed.

There is a very practical inference to be drawn from this new and startling development in medicine. A physician can no longer consider all advanced cases of tuberculosis as alike hopeless, nor excuse himself for lack of interest in those under his care, on the ground that nothing can be done. It is now incumbent on him to take advantage of the facilities for x-ray study by means of stereoscopic films now offered by the sanatorium and the out-patient departments of local hospitals as well as the tuberculosis services in these hospitals.

During the past two and a half years the writers have observed the application of compression treatment to 149 patients at the Manitoba Sanatorium²

and at Nopeming Sanatorium. In 134 of these, pneumothorax was attempted and some degree of compression was secured in this way in 107. Of the 107, twenty-one secured exceptionally good results, amounting in some cases to practical restoration to health for the time being, fifty-one were somewhat benefited and thirty-five relapsed and received no lasting benefit; eighteen have since died. All but two of the thoracoplasty cases were seen in Manitoba. Of the fifteen cases, four were very greatly improved, four showed considerable improvement and seven showed practically no improvement. Of these six have since died.

SUMMARY OF PNEUMOTHORAX CASES

	Nopeming	Manitoba	Total
Compression attempted	54	80	134
No compression secured.....	15	12	27
Some compression secured.....	39	68	107
No lasting benefit	14	21	35
Somewhat benefited	18	33	51
Exceptionally good results	7	14	21

PERCENTAGES

	Nopeming	Manitoba	Total
No lasting benefit	35.9	30.9	32.7
Somewhat benefited	46.2	48.5	47.7
Exceptionally good results ..	17.9	20.6	19.6
Total compressions secured..	100.0	100.0	100.0
	(39)	(68)	(107)

COMPLICATIONS IN PNEUMOTHORAX CASES

	Nopeming	Manitoba	Total
Pleural shock	1*	0	1
Air embolism	0	2*	2
Pleural effusion	12	32	44
Empyema	5	8	13
Emphysema (sub-cutaneous) ...	2	0	2
Emphysema (deep)	0	2	2
Spontaneous pneumothorax (rupture of lung)	3	10	13

* Not fatal.

THORACOPLASTY

Number of cases	15
Very great improvement	4
Moderate improvement	4
No lasting benefit	7

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COLDS AND THEIR TREATMENT WITH CHLORINE

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It was noted during the last influenza epidemic that influenza was rare among soldiers working in chlorinal plants while it was prevalent among others in the same locality and living under similar conditions. These observations led Colonel Vedder and Captain Sawyer to experiment with chlorine gas in the treatment of acute respiratory infections. The results of their experimental work was most encouraging and their report¹ caused great interest and laid the basis for the hope that finally a specific treatment for colds was available. The public was interested because every year a great deal of inconvenience, considerable disability and some serious consequences result from acute respiratory infections, and physicians were interested because patients are constantly coming to them for relief of these conditions, the treatment of which is most unsatisfactory.

Unfortunately, before the results of the treatment could be verified by other investigators, certain commercial houses began manufacturing various types of apparatus for the administration of chlorine in the treatment of colds and physicians began to be flooded with advertising literature making claims for the treatment and extolling the virtues of some particular type of apparatus. As Colonel Vedder has repeatedly stated² if one hopes to get consistent results with this form of treatment or even to give the treatment a fair trial, a definite and constant concentration of chlorine must be maintained in the atmosphere for at least one hour, a condition certainly not fulfilled by most types of apparatus which are on the market.

At the Students' Health Service of the University the greatest single problem with which we have to deal is the problem of acute respiratory infections; consequently, when Colonel Vedder's report appeared we immediately got in touch with him and with the Wallace and Tiernan Company, which made the equipment that he used, and inquired how

we could procure the necessary apparatus for the giving of treatments to large numbers of students. In reply, the Wallace and Tiernan Company offered to send us for experimental purposes the same type of apparatus as was used by Colonel Vedder in his experiments. We gladly accepted the offer and set aside a room to be used exclusively for the giving of these treatments.*

The apparatus used was such as to give at all times a definite and constant concentration of chlorine in the room. A concentration of between .015 mgm. and .0175 mgm. of chlorine per liter of air, as recommended by Vedder, was maintained. As students were seen in the dispensary with colds, certain ones, chosen at random, were sent in to have chlorine treatments. The others were given various forms of medical treatments or no treatment and were observed as a control series. The students included in this series were treated between October 1, 1924, and March 1, 1925. The results of the treatments, both in the series which had chlorine and in the control series which had medical treatments or no treatment, were reported by the students themselves on cards sent to them a week after they had come in for treatment. These cards contained the following three questions: (1) How many days did you have a cold before treatment? (2) How many days did your cold last after treatment? (3) In your opinion was the treatment given beneficial?

The reports made on these cards were tabulated, summarized and analyzed. In Table 1 we have a general summary of the results, irrespective of the type or the duration of the infection. This shows that the percentage of recoveries within one day after treatment is greater in the chlorine than in the control series.

The percentage of recoveries in two days, however, is just as large in the control series as in the chlorine series. The same is true in regard to the recoveries after the second day. The table also shows that the percentage of recoveries within one day is higher if the treatment is given during the first three days of the cold than if it is given after the third day.

Table 2 gives an analysis of the results according to the part of the respiratory tract involved. It

*A paper presenting more fully the results of this study was presented before the Minnesota State Medical Association on April 28, 1925, and through the courtesy of Minnesota Medicine was published in the Journal of the American Medical Association, May 30, 1925.

*Note: It should be remarked that the Wallace and Tiernan Company gave every possible assistance in conducting these observations and appeared anxious only to get accurate information, whether or not the results would tend to promote the sale of their equipment.

TABLE 1
SUMMARY OF RESULTS OF TREATMENT
(A) Treated During First Three Days of Cold

	Total Cases	Cured in 1 Day		Cured in 2 Days		Cured in 3 Days		Cured in 4-7 Days		Cured in Over 7 Days		Not Cured at Report		% Cured 1-3 Days	% Cured 1-7 Days
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Chlorine	218	49	22.5	30	13.8	30	13.8	55	25.2	19	8.7	35	16.1	50.1	75.3
Medical	209	28	13.9	41	19.6	33	15.8	46	22.0	25	12.0	36	17.2	48.8	70.8

(B) Treatment Given After Third Day of Cold

Chlorine	207	34	16.4	41	19.8	35	16.9	39	18.8	26	12.5	32	15.4	53.1	71.9
Medical	183	21	11.4	30	16.3	35	19.1	51	27.8	18	9.8	28	15.3	46.8	74.6

(C) Summary of Results of All Treatments

Chlorine	425	83	19.5	71	16.7	65	15.2	94	22.1	45	10.5	67	15.7	51.4	73.3
Medical	392	49	12.5	71	18.1	68	17.3	97	24.7	43	10.9	64	16.3	47.9	72.6

will be seen that the largest percentage of cures in one day with chlorine occurred in rhinitis and that the poorest results were obtained in the generalized acute respiratory infections, not limited to any particular area. Of the cases of acute rhinitis that were treated within three days after onset, 27.3 per cent recovered in one day as compared to 8.9 per cent of the control series.

DISCUSSION

Every physician realizes that it is frequently difficult to determine accurately the value of one form of treatment as compared to another and that this difficulty is intensified when one is dealing with such self-limited diseases as colds. For this reason it was considered necessary, in an attempt to evaluate the chlorine treatment, to have, as a control series, observations on a series of persons with colds who were not given chlorine treatments. In the tables this control series is designated as having had medical treatment, but, inasmuch as the medical treatments were varied and for the most part merely symptomatic it is doubtful whether a control series without any treatment would not have shown very similar results. The large percentage of recoveries within a few days, as shown in the control series, illustrates the necessity of having such a series in any study of colds; for example, 47.9 per cent of those in the

control series recovered within three days after reporting to the Health Service and 72.6 per cent recovered within the first week. In this study there are 425 cases in the chlorine series and 392 in the control series.

An analysis of the results reported shows a certain margin of benefit from the chlorine treatments, but this margin is small. The best results were obtained in students with rhinitis; of these, 23.6 per cent recovered within one day after treatment with chlorine as compared to 6.7 per cent of the control series. In the entire group, 19.5 per cent recovered within one day after the chlorine treatment as compared to 12.5 per cent of the control series. However, at the end of the third day after treatment we find 47.9 per cent of the control series have recovered as compared to 51.4 per cent of the chlorine series. It should be noted that this small margin of benefit is the best that we were able to obtain giving the treatments under relatively ideal conditions, so it certainly seems that physicians who use apparatus which give less accurate and less uniform concentrations of the gas could not expect much in the way of results. On the other hand if the treatments are properly given, it would seem that our results are sufficiently encouraging to justify, at least, a continuation of the treatments with a further study of the results.

TABLE 2
RESULTS OF TREATMENT IN VARIOUS TYPES OF ACUTE COLDS
Total of All Treated

Diagnosis	Total Cases	Cured in 1 Day		Cured in 2 Days		Cured in 3 Days		Cured in 4-7 Days		Cured Over 7 Days		Not Cured		% Cured in 3 Days	% Cured 1st Week
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Acute Respiratory Infection	Chl. 130	21	16.0	21	16.0	19	14.6	32	24.6	13	10.0	24	18.4	46.6	71.2
	Med. 166	27	16.3	30	18.1	27	16.3	48	28.9	13	7.8	21	12.6	50.7	79.6
Rhinitis	Chl. 203	48	23.6	28	13.8	36	17.7	44	21.6	18	8.8	29	14.0	55.1	76.7
	Med. 107	7	6.7	22	21.5	22	21.5	23	22.5	11	10.8	17	16.6	49.7	72.2
Laryngitis															
Tracheitis															
Bronchitis															
Pharyngitis	Chl. 42	5	11.8	10	23.8	3	7.1	6	14.3	10	23.8	8	19.0	42.7	67.0
	Med. 33	1	3	3	9.1	7	21.2	7	21.2	8	24.2	7	21.2	33.3	54.5
Tonsillitis	Chl. 50	9	18	12	24.0	7	14.0	12	24.0	4	8.0	6	12.0	56.0	80.0
	Med. 91	14	15.4	16	17.6	12	13.2	19	20.9	11	12.0	19	20.9	46.7	67.1

CONCLUSIONS

1. Approximately 50 per cent of people with colds will recover within three days, and 75 per cent within a week under little or no treatment.

2. Every study concerning the value of any treatment of a self-limited disease should include a control series of cases.

3. Any beneficial results from treatments with chlorine gas are experienced within the first day after the treatment.

4. Of patients with rhinitis 23.6 per cent recovered within one day after treatment with chlorine as compared to 6.7 per cent of the control series; and 19.5 per cent of the entire group recovered within one day after treatment with chlorine as compared to 12.5 per cent of the control series.

5. The percentage of recoveries within three days after treatment was almost as large in the control series as in the chlorine series, 47.9 per cent as compared to 51.4 per cent.

6. It is doubtful whether the chlorine treatment can be expected to give any beneficial results if it is administered by methods which do not give a definite and uniform concentration of the gas.

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DISCUSSION

Edward B. Vedder, Lt. Col. M. C., Edgerwood, Md.

April 9, 1925.

Dr. H. S. Diehl,
Director, Students Health Service,
University of Minnesota,
Minneapolis.

Dear Dr. Diehl:

I cannot be present to discuss your paper, as I am leaving Edgewater Arsenal for Manila June 1, and I have many details to attend to prior to my departure. I am greatly indebted to you for letting me see your paper. It is perfectly evident that you have made every effort to give the method a fair trial. I am naturally sorry that your results have not been better, but even so it appears to me that they have been sufficiently good to warrant further trial.

I am unable to give a precise explanation for the discrepancy in our results, but may make the following comments * * *:

1. According to my opinion you have altogether too many cures attributed to medical treatment and much too few attributed to chlorine.

2. I note that the results of treatment in both instances were obtained from a questionnaire sent out at the end of the week. I think it quite possible that many individuals

even of high mental attainments may give erroneous replies under these circumstances. Our results were obtained from personal conversation with the patient, the next day after each treatment, when the event was fresh in his mind. Under these circumstances it is a rare thing for us to find a patient who does not claim some improvement following each treatment.

3. According to my belief, there is no medical treatment that will cure a cold, although it is quite possible to alleviate its symptoms. I am, therefore, unable to explain your high percentage of cures by medical treatment, and am inclined to attribute them to some confusion on the part of those answering the questionnaire as to the distinction between actual relief afforded by medical treatment and a cure. Thus a sedative cough mixture will relieve the irritation of a cough and at the end of a week the patient might report that it had cured him, since the pain disappeared, although the cough may have actually persisted.

4. With regard to the chlorine treatment, I can give at least one sufficient reason for the discrepancy between our figures. Our policy has been to treat a case as early as possible, usually on the first or second day of a cold. If the patient was cured with one treatment it was so recorded, but if not, on the next day he received a second treatment. If not cured on the second day, he received a third treatment. It has been our experience that when treated in this way very few colds survive the third treatment without at least great improvement. A very high percentage are absolutely cured, meaning that all symptoms of a cold have disappeared entirely.

Now, from your table, it appears that of the total of 426 cases treated by chlorine, 335 had only one treatment. Of these, 68, or 20 per cent, were cured in one day. The remainder of this 335, or 267 cases, received no further treatment and simply recovered in the natural course of events. Had these 267 cases been given a second or even a third treatment, as we do, the percentage of cures would have been far higher, as is shown by the fact that of the 65 cases who took two treatments, 41.7 per cent were cured in three days, and of the 26 cases taking three treatments, 42.3 per cent more were cured in three days. * * *

DR. J. A. MYERS, Minneapolis: Since Dr. Diehl installed equipment for giving chlorine treatments at the University Health Service, I have been very much interested in this subject and have followed closely his work. I know that all of his work has been done in a very scientific manner and with an aim first to aid the student suffering from respiratory infections and second to contribute information to the medical profession which may be of great benefit to the public.

Last fall, after it had become quite generally known that chlorine was being used in the treatment of certain respiratory diseases and after Dr. Diehl had made a considerable number of observations at the Students' Health Service, there developed among private patients considerable demand for chlorine treatments. Inasmuch as the report by Vedder and Sawyer was very favorable, the members of the Students' Health Service staff, after considerable experience, spoke favorably of it, and there seemed to be no harm resulting from its use, I installed the Wallace and Tiernan equipment for giving individual treatments. This

treatment was recommended to patients suffering from acute infections of the upper respiratory tract. Patients who inquired regarding the value of chlorine treatment in chronic bronchitis were told that its greatest value seemed to be in the beginning of acute conditions and that it probably would not be of great value in chronic conditions. Several patients suffering from bronchial asthma, having learned of the chlorine treatment, hoped that at last a cure for their troubles had been discovered. Some insisted that they be permitted to try it. However, because it was already known that chlorine is contraindicated in asthma and hay fever I refused to administer it to any such patients. One day a young man came in when I was not in the office and told the nurse that he had a severe cold and wanted a chlorine treatment. About fifteen minutes later when I came in the nurse stated that this patient was taking chlorine treatment. I immediately recognized the name as that of a person who had in the past been treated for bronchial asthma. Although he had been free from asthma for a long time I told him we would have to stop the treatment at once for fear of causing a recurrence of the asthma. Although he had inhaled chlorine gas for only fifteen minutes he suffered from asthmatic attacks that night.

Among the patients suffering from chronic bronchitis only a small percentage were of the opinion that they received any benefit. However, the others did not feel any worse.

Among the patients suffering from acute upper respiratory infections, about 75 per cent were of the opinion that they were improved. Some of these patients became very enthusiastic over the treatment and returned during the winter every time they developed symptoms of colds. Most of the patients who were of the opinion that they had not been benefited by chlorine inhalation did not begin their treatments until the disease was of several days' duration.

Although my experience with chlorine gas in the treatment of respiratory infections is much more limited than that of Dr. Diehl, I firmly believe that it is well worth while in the treatment of certain conditions, particularly acute upper respiratory diseases (never in asthma or hay fever) during the first and second days of their existence.

DR. E. D. ANDERSON, Minneapolis: I wish to discuss this paper simply from the standpoint of treatment of whooping cough. I think that there is practically no condition which we meet in children where we will hail with more pleasure a treatment which is satisfactory than we will in the treatment of whooping cough. I think we have all had the experience that at best, even in the older children, it is usually a long, tedious disease, and in the small children and babies it is often a very serious thing. I, myself, feel that medication is of practically no value. X-ray therapy in some cases seems to help and in many of them doesn't seem to help at all.

When this work of chlorine gas originally came out, in talking to Dr. Diehl he suggested that we try it on whooping cough cases, and I was very anxious to do so. We had about four or five that I knew about which were treated by Dr. Diehl, and on those in the beginning it looked as if the results were very encouraging. I got an apparatus installed in my office. I have only had about twenty-five cases which I have treated. In the first five or six cases, I thought that they were greatly benefited by it. But then,

just as it happened with medication, with x-ray, and with vaccine therapy, at least in my experience, I soon lost my enthusiasm. After the first four or five I had five or six that were just as bad when they got through as at the beginning, and that has been my experience with most of the rest of them.

I would not say that the chlorine gas is of no value in whooping cough, but in the limited experience that I have had in this number of cases I would say that it is of no more value than the other procedures which we are now using. Personally, I feel that possibly the best results I obtain are in the giving of vaccine early. In these cases of whooping cough treated with chlorine gas, some of them were started at the very beginning of the cough, none of them had less than three treatments and some of them had as many as eight, and I feel that those who did get the best results were those which were started rather early. Just as with vaccine, when it is started after the whoop has developed, I feel that it is of practically no value. So, in conclusion, I would say that in the small experience I have had I am not particularly enthusiastic about the results from chlorine gas in the treatment of whooping cough.

DR. H. S. DIEHL (closing): With Colonel Vedder's statement that in this report too many cures seem to be attributed to medical treatment, one cannot disagree if the terms used in the tables are taken literally. However, I attempted to explain that the group given medical treatment was considered as a control series and that most of the recoveries probably should be considered as spontaneous.

The accuracy of the information obtained by having patients report on blanks mailed to them has been questioned and justly so. We used it because we did not know of any definite objective criteria upon which we could judge whether or not colds were improved. In a small series the errors of this method might be relatively large, but, inasmuch as the same method was used to obtain information from the control series as from the chlorine treated series and as both groups were large, it should be possible to compare the results in the two groups with a fair degree of accuracy.

Col. Vedder was able to give second and third treatments to soldiers who did not recover following the first treatment. Had we been able to do the same probably a larger percentage would have been benefited by the treatment. On the other hand, it should be noted that forty-eight per cent of our control series recovered within three days. It seems, also, that the procedure we followed more nearly approaches that which would be used by physicians in practice; that is, we requested patients to come back for further treatments rather than compelled them to do so.

In closing, I would say that our results certainly are not absolutely negative as were those reported by Dr. Harris of the New York City Board of Health. Particularly in acute rhinitis we found definitely beneficial results from chlorine treatment; of the patients with this condition about one out of four recovered in one day with chlorine, while of the control series only about one out of fifteen recovered in one day. By the end of three days, however, apparently almost as many will have recovered without chlorine as with it.

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION,
SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN
MINNESOTA MEDICAL ASSOCIATION, AND MINNE-
APOLIS SURGICAL SOCIETY

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its

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The rate for classified advertising is five cents per word with a minimum charge of \$1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VIII

JULY, 1925

No. 7

EDITORIAL

Case Reports

Medical research and the specialties have their own mediums of expression in journals devoted to the special fields of medicine. The Journal of the American Medical Association covers a broad national field. But the special function of a state journal is the publication of medical work being done more especially in the state concerned.

There is no more valuable or instructive way of reporting medical work than by the case report. The value of the study of a particular case has long been recognized in undergraduate medical teaching. The clinical exposition of cases has become more and more popular in medical society meetings. Publication of case reports, however, has not kept a corresponding pace.

The value of the case report is well expressed in one of the articles* recently published by Drs.

*Simmons, Geo. H., and Fishbein, Morris: The art and practice of medical writing. Jour. Am. Med. Assn., Apr. 4, 1925, 84, 1043.

Simmons and Fishbein, former and present editors respectively of the A. M. A. Journal, as follows:

The foundation of clinical medical literature is the case report, a species now becoming, for some unknown reason, almost extinct. One cause, given by the editor of a Swedish medical periodical, is the fact that the scientific level of our profession has risen so much in recent years that a physician hesitates to report an interesting case simply as a case report; he thinks he must make an exhaustive survey of the literature. Instead of a brief, practical report, he submits an unnecessary exhaustive review, which few, if any, care to read. Often a mass of details, including unimportant, irrelevant and negative findings, is presented without regard to clearness of expression. Usually, if the historical review appears to be unnecessary and the case is an interesting one, the author should simply publish his case report and omit the review of the literature. Clinical reports, made with judgment and with the correct appreciation of relative values, are always welcomed by both editor and reader.

These authors proceed to describe the technic of the case report and emphasize the desirability of the narrative style and the elimination of all unnecessary data.

Some case reports are nothing more or less than transcriptions of hospital records. The irrelevant data only obscure the picture of the case and the reader is likely to give up in disgust.

Such reports indicate the laborious method of attack too often employed in arriving at a diagnosis. Instead of thoughtfully following the leads the diagnosis is reached through a method of exclusion. Such a method corresponds to taking down the motor each time the engine won't go.

Appreciating the value of case reports, MINNESOTA MEDICINE some months ago established a section devoted to their publication. There is a vast amount of valuable medical material not only in the municipal hospitals, but also in private practice, which is, medically speaking, going to waste. Unusual cases, good and bad therapeutic results, etc., merit publication and are valuable to the readers of this journal.

We wish to emphasize the desirability of publication of case reports and urge that they be submitted for publication.

Libraries and Hospitals

Elsewhere in this number appears a short article on the Hospital Library Service in Minnesota by Miss Perrie Jones, kindly written upon request for

MINNESOTA MEDICINE. Most of our readers do not realize the extent to which this work is being carried on in Minnesota.

It is strange that the need for some such agency has never before been appreciated. The organization of the present activity along this line is a result of experience during the World War and may be charged to the small credit side of the war account.

Patients with acute illnesses have little need for library facilities. Those confined with chronic illnesses, however, find time heavy on their hands and the companionship of books helps to while away the tedious hours.

It is to be hoped that attention being called to the needs of patients for reading material, hospitals without library facilities will call upon the libraries for this service.

Similarly the war gave an impetus to the development in hospitals of opportunities for artcraft and handiwork among the patients. This work should receive more attention than it has in the past. The occupied human being is, as a rule, the happier, and mental contentment is conducive to physical recovery.

Birth Control

The subject of birth control is rapidly assuming large proportions in the minds of the people. Sociological workers have shown that the race will inevitably deteriorate if the unfit are allowed indiscriminately to reproduce their kind. Economists have shown that the increase of population is rapidly gaining upon the food supply of the world. All are agreed upon the desirability of some means for improving the race, but how it best can be done is a problem which has not yet been solved.

It is estimated that the agricultural area of the United States will produce food sufficient to support a population of 160,000,000 people. At the present rate of increase of the population, this maximum may be reached in 1960, unless other food materials are found. The time will have arrived, which Malthus predicted over one hundred years ago, when food supply is inadequate to feed the population. War, pestilence and famine are the means usually operative in restoring the balance.

The laity seems to think that the doctors possess a secret means of birth control. This is a delusion. We are aware of no sure method of regulating birth. If we did possess such a knowledge, it would be very difficult to know how to apply that knowledge with wisdom and discrimination. Who is going to decide who is fit and who is unfit to propagate his kind? Procreation is regarded as an inherent right of every individual. This idea is supported by religious teachings of ages. While it may be contended that the right to procreate is limited by the advantage to society, and that the religious command to increase and multiply is scientific heresy, it is a fact that in the present state of public feeling, no efficient method of birth control could be enforced, no matter how desirable it might be. We have not yet arrived at standards sufficiently discriminating to determine who are the physically and mentally unfit, and who are the fit. At the same time, education of public thought upon this important question is urgently necessary.

A. S.

Medical Defense

A recent bulletin has been issued by the secretary of the Minnesota State Medical Association calling attention to the radical changes instituted at the April meeting of the House of Delegates of the Association in the matter of medical defense. After June 27, 1925, at which time the new bill limiting the statute of limitations for malpractice suits to two years goes into effect, the Association ceases to defend its members. After this date it will be necessary for each member to arrange for his own medical defense.

It is not our purpose to advise members where and how to carry their protection. Rates and degree of protection vary and what suits one member may not suit another. This much can be said—the committee of the Association thoroughly investigated the proposition of medical defense and the Council has made arrangements for group insurance at a special rate, which it recommends. Although the Association is not bound to assure the company with which arrangements have been made, any specified number of policies, the success of any group arrangement is likely to depend in the future on how the members respond.

MISCELLANEOUS

HOSPITAL LIBRARY SERVICE IN
MINNESOTA

PERRIE JONES

Hospital Librarian

St. Paul

In February, 1921, through the interest of two or three St. Paul citizens and the co-operation of the Amherst H. Wilder Charity and the Public Library, came the beginnings of hospital library service in the state. The idea of having a carefully chosen collection of books for the use of patients, in the belief that certain reading for certain patients is beneficial, is not altogether new. Some twenty years ago the value of this service had been demonstrated in the Massachusetts General Hospital and in the McLean Hospital (mental), at Waverly, Massachusetts. However, the war gave this work the impetus that was needed to bring it to the general attention of hospital and library people.

The service in Minnesota began in the United States Veterans' Bureau Hospital No. 65 (Aberdeen). That library today, like all other Veterans' Bureau hospital libraries, is under the supervision of Miss Elizabeth Pomeroy, a trained librarian and a federal employe at Washington, and is under the direct care of a local federal librarian.

St. Paul's hospitalized sick, approximately 2,000, today have access to the public library as do any other citizens. In addition to the special collection of books held for the hospitals, the entire resources of the Public Library are at the service of all those within the four walls of the hospital, whether orderly or chief of staff, scrub woman or superintendent of nurses. Internes, bookkeepers, elevator men, nurses, all may use the books. Records show that each sick person reads on an average twenty books during the year. Deducting the number in any hospital who obviously do not read, such as babies, the blind, etc., it is easy to see that the actual average is much higher.

Very soon after the work was started in St. Paul, Rochester, Duluth, Minneapolis and New Ulm followed. In Minneapolis, twelve hospitals are served, in St. Paul nine, in Rochester five, in Du-

luth two, in New Ulm two. In each case the work is done by the Public Library, except in New Ulm, where the Public School Library takes its place. In Rochester the work originally started under the Social Service Department of the Mayo Clinic, but was later turned over to the administration of the municipal library.

Books furnished by the service in Minnesota have been read in eighteen different languages and on almost every subject under the sun, from batik and bolshevism to better babies, from treatises on the steel square to Camoen's lyrics in the original Portugese, from Bob Ingersoll's flings to careful searchings on evolution. The bedridden have traveled from Formosa to the land of Beasts, Men and Gods; they have followed Stefansson over the Canadian Arctic and Wallace through Labrador. Rawlinson and Powell have taken them to the Near East; they have been lost and imprisoned on the Red Desert and have all but died on a 1,700-mile trip in an open boat in the Indian Ocean. The gory glories of seal hunting are theirs, the greatest stage triumphs, the most inspiring of biographies.

To meet the demand that is sure to come from this specialized form of library work—there are thirty-seven states which boast its presence—there has been adopted at the University of Minnesota a five-year course for hospital librarians. The first three years are strictly academic, the fourth offers a straight library course, and the fifth the specialized work, which includes courses in Preventive Medicine; Mental Hygiene; Ethics of Nursing; Principles and Practice of Medical Social Service in Clinic, Hospital, and Home; Relationships of Hospital to Social Work; Occupational Therapy; Hospitals and Hospital Economics; Therapeutic Value of Reading; Nervous and Mental Conditions; Hospital Library Administration; Literature for Use of Hospital Groups; and Field Work in Hospital Library. So far as we know this is the only place in the country where such a course is offered.

Libraries are being increasingly converted to the undertaking of this service, but they need very badly the encouragement of the hospitals. Hospitals have every right to ask for such service, partly, if not wholly, at the expense of the library, and they will get it much sooner if the demand comes from them.

Should any hospital or medical man want to know more about the extent of this work or of its

possibilities, let him go to Kathleen Jones' book on the Hospital Library, with its bibliography, published by the American Library Association in Chicago, or turn to the December 15 number of the Library Journal, which has an admirable paper by Dr. William Russell, medical director of the Bloomingdale Hospital in White Plains, New York.

Very briefly, the purpose of such work, as far as the patient is concerned, is three-fold: to assist in the relief, readjustment and rehabilitation of the hospitalized sick. The next step should be to adapt the same methods to Public Health work, so that whatever benefits accrue may not be confined to hospitalization.

OBITUARY

DR. FRANK RESSLER WEISER

Dr. Frank R. Weiser of Windom died suddenly Friday, May 22, 1925, while on his way home from a meeting of the Southwestern Medical Association. Death was due to an attack of apoplexy.

Frank Ressler Weiser was born at Sunbury, Pennsylvania, November 10, 1865. His early education was received in the public schools of Millersburg. Later he took a course in pharmacy at the Philadelphia State College, following which he entered Jefferson Medical College, receiving his degree of M.D. in 1891 from the latter institution.

Following his graduation, Dr. Weiser practiced for three years at Williamstown, Pennsylvania, and in the spring of 1894 moved to Windom, Minnesota, where he practiced until the time of his death.

Dr. Weiser was active in civic affairs in both his home city and county. He served as chairman of the county Red Cross board during the war and had been chairman of the Republican county organization for several years. From 1915 to 1921, Dr. Weiser served as a member of the Board of Education for the Windom schools. He was prominent in medical circles of the state and was Councilor of the Sixth District of the Minnesota State Medical Association at the time of his death. Among the various organizations in which he held membership are the Masonic Order, A. F. and A. M.; Windom chapter No. 48, R. A. M.; Windom Commandery, No. 39, K. P.; 32 degree Scottish Rite, Valley Minneapolis; Zuhrah Temple, Mystic Shrine. He was also a member of the Royal Arcanum, W. O. W. and the Woodmen Lodge.

Dr. Weiser is survived by his wife, Mrs. Jeannette Weiser; a son, Dr. Conrad Weiser, of Minneapolis; a daughter, Miss Helen Weiser, two brothers and two small grandchildren.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

REPORT OF CONVENTION—NATIONAL LEAGUE OF NURSING EDUCATION, MINNEAPOLIS, MINNESOTA, MAY 25 TO MAY 29, 1925, INCLUSIVE

By MISS ELEANOR MOCK

Class of 1925

Ancker Hospital

Words cannot express my sincere thanks and appreciation for the opportunity that was mine when you sent me, as one of your delegates, to the convention of the National League of Nursing Education. It will be my pleasure now to tell you a few of the benefits which I derived from this meeting.

First of all, excluding all sessions, lectures and social activities, to me the most striking feature was the excellent type of idealistic woman with which we associated. One could not help but be inspired, and feel wealthier for having been in their presence.

The opening event was an address by Miss Laura R. Logan, a true model of the real nurse and woman and also president of the league. The impressions made there will never be forgotten.

The first business of the convention was the reports of the various committees. The one on nomenclature was especially interesting and characteristic of the nurse.

Reports of the Advisory Council stated that in the struggle for the great need of higher education in the nursing field, no states had been idle but all were co-operative. Although there are today 100,000 graduate nurses in the United States, the problems that confront all are the same, namely:

1. The insufficient number of private duty nurses.
2. The high cost of nursing service.

To further education for the nurse, opportunities for summer courses and institutes are at hand. An institute as described by Mary C. Wheeler, is a place to meet new friends, new faces, and learn new things. The first institute was held years ago. The idea has become very popular since, for this year fifteen will be held. Summer courses are given yearly for a period of six weeks, during which time particular stress is laid upon English and the basic or social sciences—biology, psychology and sociology.

Through the courtesy of the Minneapolis Commerce Commission, a splendid fifteen minute drive around the beauty spots of the Twin Cities was enjoyed. Then we, too, were privileged to attend the tea at the A. R. Colvin residence on Davern Hill Top.

A helpful demonstration on the care of the isolated patient was given by the student nurses at the Minneapolis General Hospital. Their routine is as follows:

The room with utensils is in readiness for the patient on his arrival. His clothes are removed by a nurse in an adjoining room. He is wrapped in a sheet, and taken to his bed on a cart. The sheet is lifted and the patient placed in bed, the nurse still being very careful not to

touch the patient, or the inside of the sheet, thereby keeping free from contamination. Then she proceeds to complete the bed, and take the patient's temperature. Now, the best technique having been applied, the nurse may, without spreading infection, proceed to care for a patient afflicted with a different disease. No orderly is permitted to enter the room. It is the nurse's duty to keep the floor clean. Terminal fumigation is similar to ours.

Excellent lectures on the care of the isolated patient were given by specialists of contagious hospitals. The most important needs in the care of these patients are:

1. Adequate preparation by study and actual experience.
2. Human sympathy.
3. Refinement.
4. Culture.

The spread of communicable diseases is prevented by using every available method and aseptic technique—medical asepsis as well as surgical is required. In the past progress in checking the spread of such diseases was slow because of fear. This can be overcome by knowledge and education as to the proper care of such patients.

The unit system was mentioned by which patients afflicted with diseases of a different nature are kept in the same room. Beds are five feet apart. Very few cross infections are reported. As the patient convalesces, he is moved to a larger unit of twelve beds. With the exception of measles and chickenpox, during the first week all cases may be kept together. In Rhode Island at the Providence City Hospital even postoperative laparotomy cases are on the same floor. It is believed that no air transmission causes disease except by "forced expulsion."

Patients are not allowed to touch the walls or door knobs, but are permitted to go out on the lawn. After termination of the case the mattress is aired for six hours and only after typhus fever, smallpox and deceased patients is sterilization resorted to.

No Schick tests are given.

After a positive Dick reaction, three small doses of Dick's serum are given (one a week).

To children exposed to measles 30 c.c. of a convalescent measles serum are given.

Scarlet fever serum is also given to all acutely ill patients.

Care of the tuberculous patient was explained by Miss Densford, of the Illinois Training School. To me her opening sentence was very striking. She said, "Like the poor, tuberculosis is always with us."

Five factors in the control of tuberculosis are:

1. Education of the public, the patient and the nurse by teaching the principles of hygienic living and health.
2. Economic factor by providing in the home an adequate income for the family to live up to the regulations given.
3. Nursing care, which includes tending to the patient's spiritual needs as far as possible and making him contented and happy.
4. Medical supervision.
5. Confidence of the patient in the doctor and the nurse caring for him.

To break the monotony of technical lectures, one which was rather humorous was given by Dr. Allan, of Michigan, on the "Need for Play."

He said: "When we work we do all we *have* to, and when we play we do all we *can*." He also advised us to exercise all the joints of our body so that we won't ossify into any particular form.

The lecture I enjoyed most was rendered by Miss Lomen, who is not a nurse, but a teacher of the teachers of little children. Her subject was based on the "New Methods in Teaching." During the last decade there has been a great improvement in the higher education of nursing. Education really means the development of the individual. It affords self-realization, gives a spontaneous free development of interest and a splendid control discipline. It comes best through freedom and initiative. Its aim is:

1. To help the individual to pull his own weight in the work of life.
2. It seeks to make a conscious attempt to progress.
3. It gives the individual an appreciation of life's values.
4. It helps us to leap progressively into ever widening and deepening experiences.
5. It aims to develop in the individual a capacity for growth.
6. It tends to help the student to lead an inspiring and beautiful life.

The teacher stimulates the student by setting problems, citing her own experiences as examples, telling of the riches in store for those who choose to be intellectual. To be so, you must "pull together" with all learning and education, have life-abiding interests and power to accumulate knowledge through wide reading, travel and study. You must have an aptitude for study and form your ideals before you begin. Then, too, you must be willing to be forgotten.

Other qualities of both teacher and student are:

1. Honesty of purpose.
2. Singleness of purpose or specialization.
3. Open mindedness.
4. Intellectual flexibility.
5. Cheerfulness to assume the responsibilities of your own acts.

It was the student's pleasure to attend a luncheon at the University Hospital, at which time we also visited the hospital. My decision was this: "There's no place like home."

Delegates from Cook County and various state hospitals visited our hospital. They enjoyed it immensely and marveled at the beautiful scenes and splendid management of the place.

Results of the convention were stimulating, broadening and profitable. The need for higher education was most stressingly stated; its aims and rewards were so fully and beautifully rendered that not one having heard these marvelous characters speak could be otherwise than truly inspired to do bigger and better things.

"Aim high and hitch your wagon to a star."

Don't be like Johnny who was "about to begin to get ready to *start*" but start and do it now. There's no time like the present.

INTER-STATE POSTGRADUATE ASSEMBLY OF
AMERICA, ST. PAUL, MINNESOTA,
OCT. 12-16, 1925

The meeting of this association, originally known as the Tri-State Medical Society, will take place this year in St. Paul under the auspices of the Ramsey County Medical Society.

Extensive arrangements are under way for the entertainment of this society and the preliminary list of University professors who will appear on the program has been announced. This list includes such well known members of the profession as Dr. George J. Heuer, Dr. Walter B. Cannon, Dr. Milton J. Rosenau, Dr. Albert J. Ochsner, Dr. H. B. Cushing, Dr. A. Mackenzie Forbes, Dr. Hugh Cabot, Dr. John P. Lord, Dr. Joseph B. De Lee, Dr. Allen B. Kanavel, Dr. John B. Deaver, Dr. Dean Lewis, Dr. Rollin T. Woodyatt, Dr. George W. Crile, Dr. Samuel Clark Harvey and Dr. William H. Wilder.

LYMANHURST STAFF MEETING

The regular meeting of the Lymanhurst staff will be held at the Lymanhurst School, 1800 Chicago Avenue, Minneapolis, Tuesday, July 28, 1925.

Following is the program of the evening:

Some points in the physiology of respiration. Dr. F. H. Scott, Professor of Physiology, University of Minnesota.

Investigation on development and size of the heart in children by teleroentgen method. Dr. Thomas Ziskin.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

The forty-second annual meeting of the Southwestern Minnesota Medical Society was held Thursday, May 21, 1925, at Windom, Minnesota.

Dr. W. J. Taylor, Pipestone, Minnesota, was voted a life member of the Southwestern Minnesota Medical Society and was presented with a fountain pen. He is the only surviving Charter Member of the Society.

A dinner and smoker preceded the scientific program, which was given at eight o'clock in the evening and included the following:

President's Address.....Dr. J. M. Hilger, Iona
Melena neonatorum.....Dr. Thomas Lowe, Pipestone
Postoperative treatment of acute general peritonitis....

Dr. W. H. Halloran, Jackson
Encephalitis, the sequelæ and a short résumé of the diseaseDr. E. M. Hammes, St. Paul
Discussion.....Drs. Wm. Piper and L. L. Sogge
Legislation.....Dr. H. M. Johnson, Dawson

BLUE EARTH VALLEY MEDICAL ASSOCIATION

At the annual meeting of the Blue Earth Valley Medical Association, held at Fairmont, Thursday, May 28, 1925, the following officers were elected: President, Dr. M. D. Cooper, Winnebago; vice president, Dr. F. Silvernail, Elmore; secretary-treasurer, Dr. R. C. Hunt, Fairmont. Drs. J. A. Broberg, Little Falls; F. N. Hunt, Fairmont, and H. P. Johnson, Fairmont, were elected trustees of the Association.

Following the business session a dinner was served at the Hotel Fairmont at 6:30 o'clock to members and their guests. The program of the evening included the following papers:

Diphtheria immunization.....Dr. G. H. Luedtke, Fairmont
Dislocation of the hip: original method of reduction of backward dislocations.....Dr. J. J. McGrority, Easton
Pulmonary embolism.....Dr. S. Herman, Welcome
Health examinations.....Dr. A. J. Henderson, Kiester
Hay fever.....Dr. J. H. James, Mankato

OF GENERAL INTEREST

Dr. G. E. McCann has moved his practice from Onamia, Minnesota, to Fargo, N. D.

Dr. F. J. Bohland of Belle Plaine recently returned from California much improved in health.

Dr. E. C. Rosenow has received the honorary degree of Doctor of Laws from Park College, Missouri.

Dr. James Fleming of Cloquet is taking the summer course in tuberculosis at the Trudeau School, Saranac Lake, N. Y.

The Royal Spanish Academy of Medicine conferred a degree on Dr. C. H. Mayo, Wednesday, May 27, at a meeting in Madrid.

Dr. H. P. Fischer of Shakopee is recovering from injuries resulting in a fractured arm received during the windstorm, June 2.

Dr. Charles Sheard, head of the Physics Department of the Mayo Clinic, has been elected a Fellow of the American Physical Society.

Dr. R. W. Adams, formerly of Barron, Wisconsin, is now engaged in a general medical and surgical practice at Montevideo, Minnesota.

Dr. Alex E. Brown of Stillwater has become a permanent member of the staff in the diagnostic service of the Mayo Clinic, Rochester.

Dr. Granville S. Delamere of the Mayo Clinic, Rochester, is now located in Berkeley, California, where he will continue the practice of medicine.

Dr. F. H. Buck of Shakopee has returned from Boston, where he took a four weeks' postgraduate course in pediatrics at Harvard medical school.

Dr. P. P. Vinson of the Mayo Clinic, Rochester, has received the honorary degree of Doctor of Science from Davidson College, North Carolina.

Dr. W. E. Sistrunk, Rochester, presented a paper on "Surgery of the Colon" before the annual meeting of the Georgia State Medical Association.

Drs. W. F. Braasch, H. C. Bumpus, and E. P. Cathcart, from the Mayo Clinic, attended the meeting of the American Urological Association in St. Louis from May 21 to 23.

Dr. W. J. Mayo gave an address at the meeting of the South Dakota Medical Association at Sioux Falls on "Studies in physiochemistry in relation to clinical medicine."

Dr. A. E. Sohmer of the Mankato Clinic is taking the Interstate Clinic Tour to Europe. He presented a paper

on the subject of "Urology in Surgical Differential Diagnosis."

Dr. G. B. Eusterman and Dr. H. Z. Giffin sailed May 23 for England to attend the meeting of the Inter-State Postgraduate Assembly in London and to tour the British Isles and France.

At the meeting of the American Association of Genito-Urinary Surgeons, held in Washington the first week in May, Dr. W. F. Braasch of Rochester was elected president for this year.

Dr. C. O. Rosendahl, Professor of Botany, University of Minnesota, gave a Mayo Foundation lecture in Rochester, May 21, on "The geographical distribution of hay-fever plants in Minnesota."

According to a recent communication received from Dr. Wilmer Krusen, Director of the Philadelphia Department of Health, 150 cases of smallpox occurred between January 1 and May 1. Among these were 18 deaths.

Dr. Arthur H. Pedersen and his mother, Mrs. J. Pedersen, of St. Paul, have left for New York, from which port they have booked passage on the Olympic for Europe. Dr. Pedersen will continue his studies in medicine while abroad.

Dr. Gerald R. Maloney of Belle Plaine has announced his retirement from medical practice following a period of fifty years' service as a "country doctor" in Scott county, Minnesota. Dr. Maloney came to Belle Plaine October 10, 1875.

Dr. and Mrs. H. J. Lloyd of the Mankato Clinic are in the East, having attended the American Medical Association meeting at Atlantic City. Dr. Lloyd is attending various clinics and doing other postgraduate work. They are motoring through.

Dr. R. D. Carman, Rochester, sailed for Europe after attending the meeting of the American Medical Association. He will travel through Germany and France and will attend the meeting of the International Congress of Radiology in London the first of July.

Dr. Verne C. Hunt, Rochester, has returned from attending medical meetings in the West. He read papers before the Arkansas Medical Society, the California State Medical Association, the western branch of the American Urological Association, and the San Diego County Medical Society.

Kaiser Wilhelm Institute, Berlin, Germany, will be represented on the faculty of the University of Minnesota during the coming summer session by Dr. Herbert Freundlich. Dr. Freundlich is a foremost authority on colloid chemistry and is one of the pioneers in the study of that subject.

Dr. Robinson Bosworth, Executive Secretary of the Advisory Committee of the State Sanatorium for Consumptives, will sever his connections with that organization on July 1 and begin his new duties as Superintendent and Medical Director of the Rockford Municipal Sanatorium, Rockford, Ill.

Among those from the Mayo Clinic attending the meeting of the American Medical Association in Atlantic City were Drs. W. J. Mayo, F. C. Mann, P. P. Vinson, M. G. Peterman, A. H. Sanford, F. A. Figi, L. J. Stacy, C. H. Greene, L. G. Rowntree, N. M. Keith, J. A. Bargaen, J. de J.

Pemberton, E. S. Judd, M. S. Henderson, C. B. Lara, W. I. Lillie, E. C. Kendall, F. A. Willius, A. W. Adson, and S. H. Mentzer.

Drs. Benedicto Montenegro, Rezende Puech, and Souza Campos, a delegation of Brazilian medical men, who came to this country at the invitation of the Rockefeller Foundation in connection with the reorganization and development of the Faculdade de Medicina e Cirurgia of Sao Paulo, visited the Mayo Clinic, May 13.

The library of the late Dr. Julius Parker Sedgwick has recently been turned over to the University of Minnesota and accepted by the Board of Regents. This gift was made possible through the contribution of friends of the late Dr. Sedgwick toward the purchase of the library for the University, to be maintained as a memorial to him.

Dr. Richard Olding Beard, the oldest member of the Medical School faculty of the University of Minnesota and the only man who has been with the school from the beginning, retired from active service, June 30, 1925. Although severing his connections with the medical faculty, Dr. Beard will continue his other interests at the University.

Dr. A. H. Brown of Pipestone is taking a two months' automobile trip through the Eastern United States and Canada. He attended the meeting of the American Medical Association in Atlantic City, the one hundredth anniversary of Jefferson Medical College and the thirtieth anniversary of his graduation. He also attended the graduation exercises of Wellesley College, where his daughter received her degree this year. Dr. Brown will visit in his former home in Canada before returning.

Service men's organizations, doctors and hospitals throughout the country are warned to be on guard against an impostor who will probably work in much the same way as he did at Montevideo, Minn., as follows:

He represented himself as an ex-regular army major of engineers, badly wounded in action and totally disabled ever since; stated that he had been operated upon repeatedly since the war in an attempt to heal a fecal fistula; he showed an abdomen literally covered with scars of operation wounds and a bona-fide fistula; said that he needed to be hospitalized and wished to enter the Montevideo Hospital for a short period.

After a few days acquaintanceship, he cashed two bad checks and disappeared.

He went by the name of Major Wm. Stewart; was about 5 feet nine inches tall; weight about 180 pounds; dark brown eyes and black hair; about 45 years old; wearing dark blue coat and trousers and black plush fedora hat. Easily identified by scars on abdomen.

Anyone having information of this man kindly telegraph collect to Sheriff of Chippewa County, Montevideo, Minn.

The following nominations were presented and approved at the May meeting of the Administration Board of the University of Minnesota Medical School: Harold E. Roe as Teaching Fellow in Anatomy; Miss Eleanor Zuppan and Miss Helen C. Peck as Instructors in Public Health Nursing; Mr. Emmett L. Schield as Teaching Fellow in Pathology; Dr. S. E. Sweitzer as Associate Professor of Dermatology and Syphilis; Dr. George S. Stevenson as

Assistant Professor of Nervous and Mental Diseases; Dr. C. A. Boreen as Instructor in Dermatology and Syphilis; Dr. Smiley Blanton as Assistant Professor of Mental Diseases; Dr. Edwin R. Eisler as Assistant in Nervous and Mental Diseases; Drs. Herbert H. Burns, Benjamin A. Dvorak, Frank R. Hirshfield, George A. Holm, Richard H. Lindquist, Robert McGandy, Charles E. Merkert, F. R. Pearson, Clifford G. Salt, Olof I. Sohlberg and George F. Swinnerton as Assistants in Medicine; Dr. Wm. W. Swanson and Edith Boyd as Instructors in Pediatrics; Dr. John M. Culligan as Assistant in Surgery; Dr. Edward A. Regnier as Assistant in Surgery; Dr. Harold R. Fehland as Teaching Fellow in Surgery; Mrs. Dorothy Kurtzman and Miss Olena Ordahl as Assistant Professors in Nursing; Miss Lana M. Babcock and Miss Hannah Burggren as Assistants in Nursing; Dr. Joseph T. Cohen as Assistant in Dentistry.

It was also voted as the sense of the Administrative Board that the same fellowship stipends be paid to University Fellows as Fellows at the Mayo Foundation, namely, \$800, \$900 and \$1,000 in successive years, and that full-time clinical assistants be paid from \$1,200 to \$1,800 a year, and full-time clinical instructors up to \$2,500 for first year and up to \$3,000 for second year service.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

LEDERLE ANTITOXIN LABORATORIES:

- Poison Ivy Extract-Lederle (In Almond Oil)
- Poison Ivy Extract-Lederle (In Almond Oil) 1 c.c.
- Rabies Vaccine-Lederle (Semple Method)

H. K. MULFORD COMPANY:

- Pollen Extracts
- Insulin-Mulford
- Insulin-Mulford 10 Units, 5 cc.
- Insulin-Mulford 20 Units, 5 cc.
- Insulin-Mulford 40 Units, 5 cc.

PARKE, DAVIS & COMPANY:

- Typhoid Vaccine (Prophylactic) 30 c.c.
- Typhoid Paratyphoid Vaccine (Prophylactic) 30 c.c.

POWERS-WEIGHTMAN-ROSENGARTEN COMPANY:

- Stovarsol
- Stovarsol Tablets 0.25 gm.

SWAN-MYERS COMPANY:

- Pollen Extracts

CHANGE OF AGENCY

Sulfarsenol, formerly distributed by Charles Leich and Co., is now distributed by the Anglo-French Drug Co., which supplies .06, .12, .18, .30, .42, .60 gm. ampules. The Council has continued the acceptance of Sulfarsenol under the new distributor.

NEW AND NON-OFFICIAL REMEDIES

Caprokol-Hexylresorcinol-S. & D.—Normal hexylresorcinol, containing not more than 5 per cent of the intermediate product hexylresorcinol. Caprokol possesses marked

germicial properties, is stated to have a phenol coefficient of 45 and to be relatively nontoxic when administered by mouth. When administered, it imparts definite germicial properties to the urine. Administration of caprokol to normal individuals caused secretion of urine which killed *Bacillus coli* and *Staphylococcus albus*, but the effect of the drug was not constant. Caprokol is proposed for the treatment of urinary infections. The drug is marketed in the form of capsules hexylresorcinol-S. & D., each containing 0.15 gm. dissolved in olive oil. Sharp and Dohme, Baltimore.

Insulin-Stearns, Single Strength.—10 c.c. vials containing in each c.c. 10 units of insulin-Stearns (New and Non-official Remedies, 1925, p. 174). Frederick Stearns and Company, Detroit.

Insulin-Stearns, Double Strength.—10 c.c. vials containing in each c.c. 20 units of insulin-Stearns (New and Non-official Remedies, 1925, p. 174). Frederick Stearns and Company, Detroit.

Insulin-Stearns, Quadruple Strength.—10 c.c. vials, each containing 40 units of insulin-Stearns. (New and Non-official Remedies, 1925, p. 174). Frederick Stearns and Company, Detroit.

Scarlet Fever Streptococcus Antitoxin.—An antitoxic serum prepared by immunizing animals against the toxin of the hemolytic streptococcus of scarlet fever. It is prepared (a) after the method of G. F. Dick and G. H. Dick by immunizing horses by injection of soluble toxins of strains of hemolytic streptococci which have produced experimental scarlet fever in human beings and (b) by the method of A. R. Dochez by which horses are immunized against the specific scarlet fever organism by the localization of the living streptococci in a subcutaneous agar nodule. Much evidence has accumulated to show that the specific organism of scarlet fever has been determined and that the administration of a serum containing the antitoxin produced by this organism will favorably affect the course of scarlet fever.

Scarlet Fever Streptococcus Antitoxin-Lilly (Unconcentrated).—It is prepared by the Dochez method. Each c.c. neutralizes at least 10,000 skin test doses of scarlet fever toxin. Marketed in packages of one vial containing 20 c.c. Eli Lilly and Co., Indianapolis, Ind.

Scarlet Fever Streptococcus Antitoxin-Lilly (Refined and Concentrated).—It is prepared by the Dochez method. Each c.c. neutralizes at least 20,000 skin test doses. Marketed in packages of one vial containing 10 c.c. Eli Lilly and Co., Indianapolis, Ind.

Scarlet Fever Streptococcus Antitoxin-U. S. S. P.—It is prepared by the method of Drs. Dick. Each c.c. neutralizes at least 1,000 skin test doses of scarlet fever toxin. Marketed in packages of one syringe containing 10 c.c. (prophylactic dose); and in packages of one vial containing 20 c.c. (therapeutic dose). United States Standard Products Co., Woodworth, Wis. (Jour. A. M. A., May 2, 1925, p. 1338.)

Lunosol.—Argenti Chloridum Colloidal Saccharatum-Hille.—A preparation of colloidal silver chloride containing silver chloride, 10 per cent, and sucrose, 90 per cent. Lunosol has antiseptic and germicial properties. It causes neither irritation of the mucous membrane nor coagulation

of albumin even in concentrated solutions; it does not stain the skin. Lunosol is intended for the prophylaxis against and treatment of infections of the accessible mucous membranes, such as the genito-urinary tract and the eye, ear, nose and throat. Lunosol is sold in bulk and in capsules containing six grains. Hille Laboratories, Inc., Chicago.

Rabies Vaccine (Semple).—An antirabic vaccine (New and Non-official Remedies, 1925, p. 342) prepared according to the general method of David Semple (phenol killed). It is marketed in packages of seven syringes, each containing 2.5 c.c. Cutter Laboratory, Berkeley, Calif. (Jour. A. M. A., May 16, 1925, p. 1497.)

Bromsulphalein-H. W. & D.—*Disodium phenoltetrabromphthalein-sulphonate.*—The disodium salt formed by the interaction of tetrabromphthalic acid (or anhydride) and phenol with subsequent sulphonation. It contains from 37 to 38 per cent of bromine. Bromsulphalein-H. W. & D. is used as a test of liver function; the amount remaining in the blood stream after intravenous injections as determined colorimetrically is considered a measure of hepatic dysfunction. Bromsulphalein-H. W. & D. is supplied in ampules containing 3 c.c. of a 5 per cent solution. Hynson, Westcott and Dunning, Baltimore. (Jour. A. M. A., May 23, 1925, p. 1573.)

Concentrated Pollen Extracts-Swan-Myers.—Liquids obtained by extracting the dried pollen of plants with a liquid consisting of 67 per cent glycerin and 33 per cent of a solution containing sodium chloride, 2.5 gm., and sodium bicarbonate, 2.7 gm., in distilled water, 1,000 c.c. For actions, uses and dosage see Allergic Protein Preparations, New and Non-official Remedies, 1925, p. 278.

Rabies Vaccine-Lederle (Semple Method).—An antirabic vaccine (New and Non-official Remedies, 1925, p. 342) prepared according to the general method of David Semple (phenol killed). It is marketed in packages of 14 syringes each containing 2 c.c. Lederle Antitoxin Laboratories, New York. (Jour. A. M. A., May 30, 1925, p. 1634.)

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

DICTOPHYME RENALE OR EUSTRONGYLUS GIGAS: REPORT OF A CASE*

MINAS JOANNIDES, M.D.
and
WILLIAM A. RILEY, Ph.D.
Minneapolis

Eustrongylus gigas is a very rare parasite. It has been found most commonly in the dog, though cases have been reported where the parasite was found in the mink, the

horse, and the human. There are 20 reported cases in the human (Leuckart), but out of these only 7 cases may be regarded as authentic (Stitt), the rest having been proven to be blood clots passed per urethram, *Filaria sanguinis hominis*, or wandering ascarides.

Because of the scarcity of this parasite a report of our accidental finding of the worm may be appropriate. The worm was found during the course of an experimental laparotomy. The dog harboring the worm was brought to this city from Seattle, Washington, and was sold to a dealer, who, in turn, sold it to our laboratory. It was an apparently healthy female dachshund and had no evidence of any gastro-intestinal or renal trouble. On opening the dog's abdomen, we found that the omentum was injected with punctate hemorrhagic areas. The serosa of the whole gastro-intestinal tract had the same appearance as the omentum. On attempting to localize the appendix a round free loop, blood-red in color, was pulled out. On further pulling, a live worm 75 cm. long and 0.8 cm. in diameter was recovered. The abdomen was then carefully explored and another female worm of the same size and characteristics was removed. The kidneys were apparently normal. The worms were kept alive for twenty-four hours before they were fixed in alcohol. The dog was alive and well ten days after the laparotomy, when it was killed and an autopsy revealed nothing new except the presence of the common types of round and flat worms in the small intestine. No eggs or young parasites were found on careful examination.

The above is the twenty-ninth case reported in this country. Riley reported three, and collected a total of twenty-seven reports of the worm in this country. In 1917, Riley reported another case and also gave facts that disproved the theory that the parasite passes into the abdominal cavity through the Fallopian tube. Stitt refers to *Eustrongylus* as the largest round-worm infecting man. He states that there are seven authentic cases of human infection.

From the study of our findings no explanation can be advanced as to the mode of introduction of the parasite into the abdominal cavity or the kidney. The study of our dog gave us no clue as to how these parasites reach the abdominal cavity. The two possible routes, namely, the implantation of the larvæ into the peritoneal cavity through the blood or lymph stream of the kidney, or a direct migration of the young or adult parasite from the gastro-intestinal canal, are the only two logical routes of extension.

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*From the laboratory of Experimental Surgery and the Department of Entomology, University of Minnesota, Minneapolis, Minnesota. Read before the Minnesota Pathological Society, April 21, 1925.

CONGENITAL ANOMALIES OF THE EYE*

REPORT OF CASE

V. J. SCHWARTZ, M.D.
Minneapolis

Mr. A. D. H., aged 56, married, was admitted to the Minneapolis General Hospital on January 27, 1925, for paranoia. His past history was negative except for an injury to the scalp eight years before, caused by a falling plank, but this had no apparent bearing on the condition present. The patient was born in Australia and educated in England.

Mental peculiarity set in six or eight weeks previous to entrance to the hospital. He became argumentative and nervous and was unable to sleep well. A week before his admission to the hospital he went to work, but did not feel well and soon became entirely disorientated. In a short time, however, he recalled his identity, became apparently more clear mentally, and was then taken home. It seems difficult to believe for one with his ocular condition, but it is a fact that for six years he had handled a heavy hammer as a riveter in the boiler-room of a railroad shop.

The patient stated that for many years he had had practically no vision in his left eye and that the vision in the right eye was failing. He also said that his father and the latter's brother had an involvement of the eye somewhat like his own; in fact, eye trouble had been hereditary among the male members of his family for several generations. He said his grandfather's eyes were clear, but that his great-grandfather's had been affected. His mother was living and well, eighty-eight years old; his father was killed in an accident; his brothers were killed in the war. He had one sister, living and well, as were also his wife and a son, aged nineteen years.

The patient exhibited a number of congenital ocular anomalies. The right eye showed a coloboma of the iris and a large coloboma of the choroid. There might also have been a coloboma of the ciliary body, but this could not be definitely stated. There was a partially developed cataract in the right lens. It seemed fortunate that the nature of his work required him to look down almost constantly, for the upper part of the retina and the choroid were intact. The coloboma, however, situated below, eliminated the greater part of his upper visual field. The optic disc itself seemed flattened, if not actually invaginated inferiorly.

The colobomata, of course, are easily traceable to a failure or incompleteness of fusion of the hyaloid fissure, or the fetal optic cleft, this being always present on the inferior surface of the optic vesicle which is pushed out on each side from the fetal forebrain. Most rapid growth takes place dorsally, a little less rapid in the lateral wall, while below there is no growth, leaving the cleft.

If the defective fusion extends far enough back toward the brain, the optic nerve will also show signs of incomplete closure inferiorly about the central retinal vessels, and so, therefore, a malformation of the disc. If the fail-

ure to close does not extend so far posteriorly, the coloboma will involve only the uveal tract; if only the most anterior portion of the cup shows a deficiency, only the iris may be involved. If this outermost portion is spanned by only a few fibers instead of by a complete closure, an accessory pupil, below the normal pupil, will be formed. Furthermore, if the fissure should shift slightly to one side instead of being in the center of the optic stalk below, an eccentric or ectopic pupil results. This patient's left eye clearly illustrated both these latter conditions.

The cataract in the right eye was only partial, but that in the left was much farther advanced. Their etiology is hard to explain. Fetal ocular inflammation has often been advanced as a theory, while Fuchs believes that a retinal detachment, from adhesion to the margins of the coloboma, may here be present, in which case the lens would suffer through a change in its nutrition or through permeation with inflammatory products.

HERNIA OF THE BROAD LIGAMENT FOLLOWING THE ORIGINAL TYPE OF GILLIAM OPERATION*

REPORT OF CASE

J. H. SIMONS, M.D.
Minneapolis

D. S., a woman, aged 20 years, entered the hospital March 13, 1925, complaining of (1) pain in the lower abdomen, bilateral, and (2) vaginal discharge.

The patient was unmarried. In July, 1924, she had a miscarriage at three months, following which she began to have pain in the right lower quadrant associated with fever and purulent discharge. She stated that this was spontaneous. August 19 she was operated upon for an inflammatory disease of the pelvis. At this time the right tube and right ovary were removed. The left tube was only slightly inflamed. The appendix, which was bound down to an inflammatory mass and showed some inflammatory changes, was also removed. The uterus was in third degree adherent retroversion and a suspension operation was done. On the right side this was done by a modified Gilliam and on the left by the original Gilliam method. After this operation the patient felt quite well until September, when she began to have dull aching pain in the left lower quadrant with a prickly sensation, usually worse at her menstrual periods. She had been moderately constipated. The pains had increased during the last two months and at the time of entrance to the hospital they radiated to the left leg. For the past two weeks she had also had some moderate pain in the right lower quadrant. She had had a persistent vaginal discharge since her miscarriage. This was the only pregnancy.

When a child the patient had measles, chickenpox, and pertussis. Menstrual periods began at fourteen years and were irregular at first. There had been no periods for the past three months, the last one having been in December, 1924. Prior to this, the periods had been the regular

*From the Eye, Ear, Nose and Throat Service, Dr. F. J. Pratt, Chief, Minneapolis General Hospital.

*From Division A, Gynecological Service, Dr. F. L. Adair, Chief, Minneapolis General Hospital.

twenty-eight day type. There was no history of venereal disease. The family history was negative.

The patient stated that she had had pains after eating, with occasional vomiting and persistent constipation. She was rather poorly nourished, the asthenic type. The skin was normal, but pale. Temperature was normal, pulse 76. The breasts were normal. The thyroid was palpable. There were no palpable nodes. Examination of the head was negative and neurological findings were negative. The chest and heart were within normal limits. Examination of the abdomen revealed a low midline scar, and slight tenderness in both lower quadrants, more marked on the left side, but no rigidity or palpable masses.

Bimanual examination showed the following: Some mucopurulent discharge from the vagina; Bartholin's gland enlarged to about 1 cm. in diameter; cervix pointing downward and backward; corpus in anterior, normal position, and of normal mobility; the right adnexal region negative. A left adnexal mass was found, pointing outward, downward, and backward into the cul-de-sac.

A diagnosis of left salpingo-oöphoritis and chronic Bartholinitis was made and an operation recommended.

March 25 the patient was operated upon by Dr. J. H. Simons. A lower midline incision was made, removing the old operative scar. Numerous adhesions were found between the omentum and the abdominal wall. These were separated and the raw edges turned in. The uterus was in good anterior position and was of normal consistency. In the broad ligament on the left side, where a Gilliam suspension of the original type had been done, there was a hernial opening large enough to admit a loop of bowel. The right side, on which a modified Gilliam suspension had been done, was in good condition. The left tube was fairly normal but was removed. The hernial opening was closed and the round ligament cut close to the abdominal wall, the raw surfaces turned in and peritonealized. The abdomen was closed in the usual manner.

The patient made an uneventful recovery and suffered only slight pain over the whole abdomen during her convalescence.

The Parathyroid Hormone.—Postoperative tetany has been relieved by parathyroid grafting. This fact, in connection with other obvious considerations, has prompted the belief that the parathyroid supplied an indispensable hormone to the body. The attempts to use desiccated gland substance or extracts in a replacement therapy have not, as a rule, been attended with success. However, Collip has succeeded in preparing extracts of parathyroid glands that control or prevent tetany in parathyroidectomized animals, and permit them to live. The active principle in this extract produces its effect by causing the calcium content of the blood serum to be restored within normal limits. Coincident with the marked improvement observed after the use of the active extract, a rise in blood calcium has been noted. It has been found that an overdosage with the active extract may push the rise of blood calcium to a condition of hypercalcemia that may even become fatal. These findings on animals warn against careless applications of the new discovery to man and extol the advantage of animal experimentation as a preliminary to human therapy. (Jour. A. M. A., May 16, 1925, p. 1499.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

LATENT JAUNDICE AS A SYMPTOM OF BILIARY COLIC: G. de Takats, Budapest (Annals of Surgery, 1925, lxxxi, 108-110). Thirty per cent of all gallstone cases and 75 per cent of common-duct stone cases have jaundice in their history. The author used the Von den Bergh method in investigating fifteen cases during or shortly after attacks of biliary colic. Gallstones were verified in every case by operation. In each case the blood showed an increase in bilirubin content, from 1.5 milligrams to 8 milligrams in 100 c.c. of blood. Only one of these cases developed visible jaundice; this patient had bilirubin of 8 milligrams on the day following the attack and became jaundiced on the fourth day. At operation an impacted stone was found in the papilla of Vater. The threshold of elimination for bilirubin is supposed to be at 2 milligrams in 100 c.c. of blood. Assuming that increased bilirubinemia is due to increased bile tension from muscle spasm, atropin should stop pain, diminish bile tension, and decrease the bilirubinemia.

In four of five cases the hyperbilirubinemia could be lowered by the intravenous injection of .5 milligram of atropin. This fact might be explained by the relaxation of the muscles that regulate bile flow.

No definite conclusions are drawn in this article. "

J. K. HOLLOWAY, M.D.

THE SURGERY OF JAUNDICE: John B. Deaver (Annals of Surgery, 1925, lxxxi, 287). The author defines jaundice as a condition in which an excessive amount of bile of certain qualitative characteristics circulating in the blood causes a yellowish pigmentation of the skin and mucous membranes. Three pathogenic types of jaundice may be recognized, one type due to obstruction, another to excess and perverted hemolysis, and a postoperative type due to infection and often operative trauma.

Catarrhal jaundice, which probably results from a mild cholangitis, usually yields to nonsurgical treatment. In those cases that do not, surgical exploration frequently reveals a mild pancreatitis. This the author attributes to infection which has extended from the papilla of Vater

into the pancreatic and common bile ducts. In such cases bile drainage should be instituted. Obstructive jaundice is the most common surgical type. It has its origin in the liver and is due to some form of obstruction to the flow of bile, either within or without the ducts. A contracted papilla of Vater, which results in a stricture, may lead to permanent obstruction of the papilla. Inflammation of the pancreas which may extend on to the portion of the duodenal wall including the terminal portion of the common duct may cause such a stricture. Obstruction due to compression from primary or metastatic tumors from syphilitic processes, as well as from scars of duodenal and gastric ulcers, and stones in the common duct, can be relieved only by operation.

Jaundice of hemolytic icterus is explained as a result of diminished resistance of the red blood cells and their destruction in the spleen in large numbers. The liver is flooded with pigment which increases the viscosity of the bile and produces inspissated plugs in the small biliary ducts. Quoting W. J. Mayo, "This condition can be cured only by removal of the spleen, which cannot be done too early." Chronic jaundice of biliary cirrhosis can be relieved only by early drainage operation. W. J. Mayo divides biliary cirrhosis into three groups. The most common type is that resulting from infectious and obstructive processes having origin in the gall-bladder or common duct, the usual cause of which is stone in the common duct and enlargement of the head of the pancreas. In the second type there is no demonstrable obstruction or infection in the bile ducts; the ducts are thickened, jaundice is chronic, and splenic enlargement is marked. The liver is also enlarged and firm. In such cases bile drainage is indicated and at times splenectomy. The third is the splenic type, for which little can be done.

Postoperative jaundice if temporary is usually due to cholangitis, and is the result of manipulation. Delayed and persistent jaundice usually means injury to the common duct. In jaundice of cholangitis not due to calculous obstruction but to choledochitis with thickening of the walls of the duct, anastomosis of the gall-bladder to the duodenum is the best operative procedure. When the gall-bladder is present and intact, and the lesion is a nontraumatic stricture of the duct, dilatation of the stricture and the introduction of a T-tube should be effected.

The postoperative dangers to the jaundiced patient are hepatic insufficiency and bleeding. The former is frequently fatal in spite of measures such as water by mouth, saline, and glucose solution by enteroclysis or intravenously. There is apparently a close relationship between hepatic and renal insufficiency and these patients practically always die of uremia. When the urine contains acetone or diacetic acid operation should be delayed except in emergency cases. Bleeding is rarely seen following preoperative administration of calcium chloride intravenously. Preoperative attention should be directed to the circulation, blood sugar, urine and urinary output, cardiac function, focal infections, and obesity. Obesity should be reduced. There is a relation-

ship between high blood sugar and the glycogenic function of the liver, and the high fever in hepatic insufficiency following operation is also significant.

Traumatism of the ducts occurs in spite of care. When recognized, reconstruction should be attempted. It is frequently satisfactory to introduce a T-tube and permit long drainage in cases where edge to edge apposition of cut ends of the duct cannot be obtained. Cholecystoduodenostomy is preferable to cholecystogastrostomy if the duodenum can be mobilized.

J. K. HOLLOWAY, M.D.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

INTRAMUSCULAR USE OF ETHER IN PERTUSSIS:

Abraham Tow, M.D. (*Amer. Jour. of Diseases of Children*, April, 1925). The successful treatment of pertussis has long been a stumbling block in the progress of medicine. This disease, although in itself rarely fatal, leaves behind an individual susceptible to many pulmonary conditions, especially tuberculosis.

The use of ether intramuscularly also has been recommended, and in order to determine the value of this method, all patients with whooping cough seen at the out-patient department of the City Hospital from July to December, 1924, were so treated.

In this series, a commercial brand of sulphuric ether used ordinarily for anesthesia was taken directly from its container and was injected deep into the gluteal region. One cubic centimeter was given to all patients under 1 year of age, and doses up to 2 c.c. to those above that age. Injections were made daily for three to six days and then every other or third day, according to the need of the patient. If there was no improvement after five or six injections, they were discontinued. The point of election for injection was posteriorly about 2 inches (5 cm.) below the middle of the crest of the ilium deep down almost to the bone.

The breath of those injected developed an ether-like odor within thirty minutes after the injection, and this lasted from four to six hours. The earlier the treatment is instituted the more likely is the possibility of a successful result. The danger of necrosis must always be borne in mind. But it is more likely that the action of the ether is due to its narcotic properties.

Eighty-two per cent, or 50 out of 61 children suffering from whooping cough were aided by the use of ether intramuscularly. The ages varied from 20 days to 7 years. The number of paroxysms was reduced and their severity

lessened; the patients slept better; their appetite improved, and vomiting also was lessened.

Eight per cent, or 11, were not aided.

Seven out of 80 patients, or 9 per cent of the total number, had necrotic areas at the site of injection. Each of these had one area, except one patient who had two small patches. In only two instances were the local reactions severe.

Eight out of 385, or 2 per cent of the total number of injections, were complicated by necrosis.

Ether intramuscularly is a valuable drug in the treatment of pertussis.

The use of ether intramuscularly is not without danger of necrosis.

R. N. ANDREWS, M.D.

THE VALUE OF GASTROINTESTINAL X-RAYS IN THE DISEASES OF CHILDREN: T. Wood Clarke, M.D. (Arch. of Ped., December, 1924). The examination of the gastrointestinal tract by means of the *x*-ray following barium administered by mouth or by rectum is undoubtedly one of the greatest additions of recent years to the armamentarium of the internist, and the value is becoming yearly more thoroughly recognized by the profession.

Today intussusception may and should be recognized within a few hours. There is nothing in diagnosis more gratifying than the results of a barium enema, and observation under the fluoroscope during the first few hours of an intussusception in an infant. Another condition in young infants in which roentgenoscopic examination is a great help is congenital pylorospasm or pyloric stenosis.

A stomach that empties in two hours can be said to have no pylorospasm or stenosis. One that contains barium between two and four hours suggests a mild degree of pylorospasm, and one that still shows barium in the stomach in any appreciable quantity after four to five hours can be diagnosed as probably a severe grade of pylorospasm or an organic pyloric stenosis. Four-hour retention, however, must not be considered as an absolute indication for immediate surgery, as at times the cases that appear clinically to be most markedly stenosed will recover nicely with proper care without operation.

Adhesions about the pylorus may be suggested by the absence of the duodenal cap, and adhesions about the appendix by retention of barium in the cecum after forty-eight hours. The most interesting finding of all, however, is the old chronic appendix, which may be strikingly shown in certain cases in which appendicitis has never been suggested. The author's experience confirms me in the belief that a shadow of the appendix shown four days following barium by mouth is a most valuable aid in determining the presence of a chronic inflammation of the appendix.

A thorough gastrointestinal examination by the *x*-ray is a valuable adjunct to clinical examination and blood, stool and stomach analysis, in the clearing up of obscure gastrointestinal abnormalities in the child.

R. N. ANDREWS, M.D.

BOOK REVIEWS

PHYSICAL DIAGNOSIS. W. D. Rose, M.D., Lecturer on Physical Diagnosis and Associate Professor of Medicine in the University of Arkansas, etc. Fourth Edition. Three hundred nineteen illustrations. St. Louis. C. V. Mosby Co., 1924. Price \$8.50.

Up to page 346 in this edition, there have been no changes of the text found in the third edition published in 1922. At the point mentioned the title "Sphygmography" becomes "Polygraphy" and there is written a new description of the use of the clinical polygraphy by which synchronous tracings are made of the radial pulse, the cardiac impulse and of a third pulsating area such as the carotid artery or the jugular vein. The plates illustrating this portion of the book have been changed also, and no fault should be found with the clearness of the description of this diagnostic method which helps the practitioner in the clinical study of the various forms of arrhythmia.

Five-sevenths of the pages of this book are devoted to the diseases of the organs of the thorax. The remaining pages take up the consideration of the abdominal organs, the head, neck and extremities and of the nervous system. The knowledge that can be gained of these parts of the body by sight, hearing and touch, aided by all known helpful mechanical appliances, is set before the reader in an excellent manner, clear, concise and free from padding. No work has been written better suited to the use of the practitioner.

The rapidly developing study of the heart-beat and the use of the electrocardiograph are set forth plainly. Few will fail to find it profitable to go over again the points that are important in the diagnosis of diseases of the heart, the lungs and the abdominal viscera or will fail to find new suggestions in the description of the methods recommended for the examination of the head, the extremities and the nervous system. Very valuable suggestions are contained in the diagnostic theses relating to the differentiation of the various forms of cardiac arrhythmia, suggestions helpful for bedside diagnosis without the use of complicated apparatus.

It is interesting to note that into the diagnosis of paroxysmal tachycardia there has crept a reference to some of the mechanical measures for checking the paroxysm, because the success of these measures forms a kind of therapeutic diagnosis.

W. DAVIS, M.D.

NEW AND NON-OFFICIAL REMEDIES, 1925, containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1925. Cloth. Price, post-paid, \$1.50. Pp. 461+XL. Chicago: American Medical Association, 1925.

New and Non-official Remedies is the publication of the Council on Pharmacy and Chemistry through which this body annually provides the American medical profession with disinterested critical information about the proprietary medicines which are offered to the profession and which the Council deems worthy of recognition. The book also

contains descriptions of non-proprietary medicines which the Council considers worthy of consideration.

In addition to a statement of the actions, uses and dosage of each product, many of these are arranged in classes and these classes are introduced by a general discussion of the group; thus the silver preparations, the iodine preparations, the arsenic preparations and the biologic products are preceded by a thoroughly up-to-date discussion of the group.

A glance at the preface shows that, in addition to the description of the new drugs which were accepted during the past year, the book has been extensively revised; many of the preparations listed in the previous edition have been omitted and the statements of the properties of others have been revised to bring the descriptions in accord with present day knowledge. Of particular interest is the revision of the general articles; thus the article on endocrine products has been entirely rewritten to bring this chapter in accord with the series of articles on glandular therapy which were published in 1924 under the auspices of the Council. A general article on medicinal dyes has been added.

A section of the book (brought up-to-date each year) gives references to proprietary articles not accepted for New and Non-official remedies. This list, in conjunction with the book proper, constitutes a cumulative index of proprietary medicines which physicians may consult when some proprietary product is brought to their attention.

Physicians cannot dispense with the newer remedies that are being brought out, yet they can neither judge them on the basis of the manufacturers' claims nor have they the opportunity or time to determine their merits. For this reason every physician should possess a copy of the annual volume of New and Non-official Remedies which the Council on Pharmacy and Chemistry puts at his disposal.

FROM INFANCY TO CHILDHOOD. Richard M. Smith, M.D. The Atlantic Monthly Press, 1925.

This small volume contains many valuable suggestions to parents for the proper physical care and mental training of their children.

It is written in clear, concise language covering the following subjects: Doctor, Mother and Nurse, The Nursery, Physical Development, Care of the Body, Clothes, Food, Daily Routine, Sickness, Training and Education.

It also contains two pages of first aid suggestions. Weight, height and age tables for girls and boys and graphic charts showing average height and weight progress for girls and boys are given. The author stresses the importance of regular and complete physical examinations by a physician and the value of medical counsel.

It is a book that we can recommend to our clients to guide them in caring for their children.

J. D. GEISSINGER, M.D.

FOR SALE—Late type 120 Kilovolt Acme International X-ray Generator complete with filament control for 220 volt alternating current. Also Acme International combined radiographic and fluoroscopic table for both horizontal and vertical fluoroscopy. Two Coolidge tubes. Complete dark room equipment. Also have some office equipment to sell. Splendid buy for someone who is just installing an x-ray department. Address C-31, care MINNESOTA MEDICINE, or telephone, Minneapolis, Atlantic 3380.

FOR SALE — Practice of physician recently deceased. Also office equipment (does not include x-ray), books, five-passenger car. Near Twin Cities, in city of 12,000 inhabitants. Splendid hospital. Exceptional location for German-Catholic doctor. Address C-28, care MINNESOTA MEDICINE.

OFFICE SPACE FOR RENT at 630 Syndicate Bldg., Minneapolis, with three other doctors. Either oculist and aurist or pediatrician preferred. Address C-30, care MINNESOTA MEDICINE.

WANTED—Preferably young man to help out during vacation of one or two partners in a general and surgical practice for two to four weeks. Possibly permanent. State remuneration expected. Address C-29, care MINNESOTA MEDICINE.

FOR SALE—Haldane Basal Metabolic Machine; includes three Haldane units, motorized, on stand, tank separate. Will sell very reasonable. A. G. Stasel, Business Manager, Nicollet Clinic, 1009 Nicollet Avenue, Minneapolis, Minn.

FOR SALE—General practice in southern Minnesota village; good dairy farming community; three tributary towns without physician; cash receipts last year, \$9,000. Residence designed for use as small hospital; separate office building. Good man will make money from start. Address C-25, care MINNESOTA MEDICINE.

WANTED—Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

COLLECTION SERVICE—American Medical Board of Adjustors, First National Bank Building, Chicago. Guaranteed *Delinquent Collection Service*, anywhere U. S. A. (Medical profession exclusively). Debtors pay you direct. Litigation avoided. Adjustments encouraged. No "Agency" methods. Financially responsible. WRITE!

FOR RENT—Very suitable space for physician, in Hamm Bldg., St. Paul. Furnished reception room. Reasonable. Address C-33, care MINNESOTA MEDICINE, or telephone Cedar 2460.

WANTED—A location, by a Minnesota graduate, 1923. Have had two years' general practice following an eighteen months' internship. Six months' experience in physiotherapy. Prefer association with a busy, well established physician or with a clinic, but will consider purchase of a desirable practice. Address C-32, care MINNESOTA MEDICINE.

Minnesota State Medical Association

FIFTY-SEVENTH ANNUAL MEETING

April 27, 28 and 29, 1925

MINNEAPOLIS, MINNESOTA

PROCEEDINGS OF THE HOUSE OF DELEGATES

FIRST MEETING—APRIL 27, 1925

The first meeting of the House of Delegates was held in Room 104, Anatomy Building, at 2 p. m., with President W. L. Burnap in the chair.

The following Committee on Credentials was appointed: Dr. Vernon C. Hunt, Rochester; Dr. H. C. Cooney, Princeton; Dr. B. S. Adams, Hibbing.

Motion to accept the minutes of the last meeting as published in the December issue of MINNESOTA MEDICINE was made.

Report of the meeting of the Council by Dr. H. M. Workman was accepted.

Attorney's report was read by the Secretary:

St. Paul, Minn., April 21st, 1925.

Dr. E. A. Meyerding, Secretary,
Minnesota State Medical Association,
Saint Paul, Minnesota.

Dear Doctor:

You have requested it, and we make report to the Association covering the work done by us during the current fiscal year, including reference to pending cases:

Flynn vs. O'Hara. The charge of malpractice in this case is in producing lacerations, with resulting infections, in the treatment of Manda Flynn in childbirth. The action has been once tried, but the court granted a new trial. The action is still pending.

Walrath vs. Hammermeister. The charge of malpractice is in injecting ether into the leg of the patient, thereby causing injury to the sciatic nerve, leaving the patient in a crippled and paralyzed condition. The patient suffered from pains in the leg. A companion suit was brought by the husband. The actions have been dismissed.

Anderson vs. Ulrich. The charge of malpractice in this case is that the plaintiff did not have surgical resistance, that she was sensitive to poison, and in applying protein sensitization tests, improper dosages were used, resulting in twenty-nine ulcers. The improper dosages, if any, were administered by the interne at the Minneapolis General Hospital. The action has not been pressed and is pending.

Ritter vs. Barber. The charge of malpractice in this case was that Dr. Barber failed to administer tetanus antitoxin in the case of a boy injured by a toy pistol. The accident happened about July 4th. The boy died of tetanus. A jury verdict was rendered in favor of Dr. Barber.

Lorenz vs. Lerche. In this case the plaintiff had fractured his leg and the fracture had been reduced by another

physician and surgeon. When the plaintiff came to Dr. Lerche there was fibrous union and inapposition of the fragments. Dr. Lerche performed an operation for bone graft. The charge of malpractice against Dr. Lerche was in advising an operation and in applying too tight a cast, all resulting in a case of non-union with ankylosis of the ankle joint. The case was first tried by other attorneys and a verdict rendered in the sum of \$15,000. We took charge of the case on appeal, with the result that a new trial was granted. On the second trial, the verdict was \$2,500.

Evju vs. Meckstroth. In this case the plaintiff suffered a fracture of the tibia and fibula. Dr. Meckstroth reduced the fractures, applying a cast. Suit was brought, and the charge of malpractice was that inapposition, requiring a second operation, which was done by metal plate. After a trial of several days, the case was settled in the sum of \$3,500, under the rules of the Association in such case made and provided.

Pettit vs. McGroarty. The charge of malpractice is that Dr. McGroarty negligently diagnosed the illness as dysentery and administered improper dosages, resulting in the death of the patient, a child eleven years of age. The action is pending.

Gray vs. Johnson. In this case, Dr. Gray brings suit for his fees. There is defense of malpractice, the charge being that Dr. Gray failed to properly care for a hand mangled in a corn shredder, with resulting infection and necessitating amputation of the index finger. The charge of malpractice has been dismissed.

Korman vs. Hagen. The charge of malpractice in this case is in the fracture of the femur of the infant in premature delivery in childbirth, resulting also in Erbs paralysis. The action and the question of liability is pending in the Supreme Court.

Backlund vs. Conner. The charge of malpractice in this case is in the severing of the tri-facial nerve in mastoiditis. The action has not been pressed and is pending.

Hunt vs. Reihls. Drs. Hunt & Hunt brought suit for their fees, and the defense of malpractice has been interposed. The defendant was being treated generally by the doctors, and the malpractice in the pleadings is not specifically stated. A motion is pending to make the same more definite and certain. The charge of malpractice seems without merit. The action is pending.

In addition to the foregoing, a number of legal opinions have been rendered to the Association bearing upon various questions and some legislative work has been done in co-operation with the legislative committee. A few claims

of malpractice are pending taking the form of correspondence, but no action has been brought thereon.

Very truly yours,

OPPENHEIMER, PETERSON,

DICKSON & HODGSON,

By George W. Peterson.

Report of Secretary read by Dr. E. A. Meyerding.

Report of the Treasurer read by Dr. Earle R. Hare.

DR. W. F. BRAASCH (Rochester): The report of the Finance Committee of the Council is as follows: We would suggest that the Council recommend that these reports be laid on the table and referred back to the Council for consideration at the end of the fiscal year. We make this recommendation because with the meeting that breaks into the fiscal year it is practically impossible to look over our financial reports and balances at this time of the year. If we can let it go until the end of the year, until October first, there will be a special meeting of the Council about then to go over the reports in detail at that time. I move you that this recommendation be accepted.

Report of Dr. J. C. Litzenberg, delegate to Congress on Medical Education, Medical Licensure, Public Health and Hospitals, read by the Secretary:

April 25, 1925.

To the President and House of Delegates,
Minnesota Medical Association.
Gentlemen:

Your delegate to the Annual Congress on Medical Education, Medical Licensure, Public Health and Hospitals, begs leave to submit the following report:

A meeting was held in Chicago, March 9 to 12 inclusive, 1925. A detailed report of the Congress has been printed in the Journal of American Medical Association. Therefore, I shall not attempt a complete review of the work of the Congress, but shall simply take time to point out a few important factors.

The Congress is composed of the Council on Medical Education and Hospitals of the American Medical Association, a federation of two medical boards and the American Conference on Hospital Service, and the Bureau of Health and Public Instruction.

The most interesting factors of the program on the Council of Medical Education and Hospitals was the symposium of the twenty-five years progress of medical education. It is hardly necessary here to make any remarks about the progress of medical education in the last quarter of the century except to say that there is a strong feeling in certain quarters of the American medical profession that medical education has been over-developed; that the curricula of the medical schools have been increased too much, and that the average medical school is giving too much attention to the development of specialists and not enough to the general education of general practitioners. This opinion is not universally accepted, but there is a certain unanimity of opinion that the medical curriculum should be revised, led by Dr. William Allen Pusey, president of the American Medical Association. Many men believe that there should be a radical change in medical teaching, even to the extent of cutting out the pre-medic college preparation, and also advocating material shortening of the medical schools, basing their arguments chiefly upon the lack of

rural physicians. The conservatives, however, believe that while the medical curriculum may need revision it should be done only after a thorough survey of the situation. Some such surveys have been made, one of which was in the state of Minnesota by Dean Lyon of the Medical School. Dr. Lyon reported that the exaggerated lack of physicians as reported by some states does not exist in Minnesota except in the thinly populated sections of the state which could not support a physician, and he suggested that this was rather a sociological problem than a problem in medical education. The conservatives believe that the problem of rural medical practice is not due to a lack of physicians, but due to an improper distribution of physicians. It is the opinion of your delegate that too many of the arguments on both sides are based on insufficient data, and that a survey made by each state is necessary before a wise conclusion can be made. This was particularly emphasized in the paper by Dr. Raymond Pearl, of Johns Hopkins University, who analyzed the report of the General Education Board which had made such a survey. Dr. Pearl's conclusions were that distribution of physicians was entirely an economic one. Your delegate recommends that every physician in the state of Minnesota read the paper of Dr. Pearl which appeared in the Journal of the American Medical Association. He also recommends that data necessary to the solving of this problem be collected by the secretary of the Minnesota State Medical Association.

Respectfully submitted,

JENNINGS C. LITZENBERG.

Dr. R. E. Farr's report for the Editing and Publishing Committee read by Dr. J. T. Christison:
Minnesota State Medical Association:

It gives me pleasure to present this, the eighth annual report of the income and expenses of MINNESOTA MEDICINE. The following report covers the seven months elapsing between the 1924 annual meeting of the Minnesota State Medical Association and the present meeting.

The seven numbers of MINNESOTA MEDICINE published since the preceding annual meeting have contained the largest number of pages that have ever been printed in a like number of issues. The last seven issues of the journal have contained an average of nearly one hundred and twelve pages each issue. There has also been a slight increase in the number of original articles published in the journal and a larger number of illustrations than have ever appeared during any similar period. We have published sixty-eight original articles since the October, 1924, meeting of the Association, averaging nine and seven-tenths each issue. There have appeared in the journal, one hundred twenty-nine illustrations during the past seven months, or an average of more than eighteen illustrations each issue. We are publishing twenty-five hundred copies of MINNESOTA MEDICINE monthly. The distribution of these copies is approximately as follows: Members—Minnesota State Medical Association about 1,950; paid subscriptions outside of the state of Minnesota, exchanges and advertisers, 404. Six copies are mailed each month to the American Medical Association and fifty copies are placed in the permanent files. The remainder is used for advertising solicitors, sample copies and to supply subscribers with misplaced copies or those lost in the mail.

During the past seven months MINNESOTA MEDICINE has averaged about thirty-five pages of advertising an issue and we are now carrying an average of forty pages display advertising each issue. The total gross display advertising executed in the journal for the past seven months amounts to \$6,070.66. This is by far the best showing we have ever been able to make. At the present time we are averaging in display advertising, gross, close to \$1,000.00 an issue, and there are represented in the advertising pages of MINNESOTA MEDICINE nearly one hundred firms. And it should be borne in mind that we are restricted in the solicitation of advertising to those firms and products conforming with the rules and regulations of the Council of the A. M. A.

You will observe that the surplus for the seven issues published since our last annual meeting amounts to \$1,337.39 and that we have taken credit in subscription allowance from members of the Association of only seven-twelfths of a year.

Respectfully submitted,
EDITING AND PUBLISHING COMMITTEE,
R. E. Farr, Chairman.

Report of the Committee on Public Policy and Legislation was read by Dr. H. M. Johnson:

To the President, Officers and Members of the House of Delegates of Minnesota State Medical Association:

Your Committee on Public Policy and Legislation desires to make the following report:

First, that we have accomplished that which we set out to do, namely, secured the passage of Bill known as Senate File No. 241, which decreased the period in the Statute of Limitations from six to two years for the commencement of malpractice suits against doctors, dentists, hospitals and sanatoriums.

The passage of this Bill should be of great value to the medical profession, because, in the first place, after examining the private files of the medical insurance companies, we found their records showed that one-third of the suits were brought after two years and that nearly all of these were of the blackmailing type. Several were brought within a few days of the expiration of the six year period. Such late suits left the party sued in a defenseless position, as his witnesses were far away, his evidence in many cases lost or destroyed. This fact seems to have been discovered more and more by the ambulance chasing type of attorneys, as these were the particular type of cases which seemed to be on the increase. Also there were apparently many cases settled out of court. Records further showed that malpractice suits had increased about three hundred per cent the past five years and that they were still going strong. The larger increase was in the cities, but it was spreading fast into the country districts.

Three insurance companies had left the state. The Medical Protective Company told us they were going to leave the state unless some legislation like this could be passed, as they could not be protected properly. Among the companies staying with us, the Medical Protective Company was probably the only one which had not raised its rates and that charged the same rate in Minnesota as in other states. While the rates of some companies were much higher in Minnesota than in surrounding states, they

probably were not too high in proportion to the difficulty of defending us. The Medical Protective Company claimed they had been losing money in Minnesota, but their loss had been absorbed by the business in general, as they do business in every state in the Union. Of the other companies staying with us, some charged \$47.50 in Minnesota for the same policy that the men in Illinois were paying \$20.50 for.

Eventually these companies which have raised their rates should come down in their charges and I am free to tell you that I believe if this law had not been passed, the Medical Protective Company would have pulled out of the state and these other companies would have raised their rates to about \$75.00, as they decided at one time to do—April 1st, 1921—for the same policy which in other states they received something over \$20.00 for. This information in regard to the intended rates was obtained from the March 10, 1921, issue of the National Underwriters.

The saving to the profession is hard to estimate, but figuring the insurance rates and believing those companies which have raised their rates will eventually be able to lower them,—the money paid out either in settlement of judgments or in cases settled out of court,—it probably will run from \$50,000 to \$100,000 a year, possibly more. The mental worry and anxiety caused by these blackmail suits are something that cannot be figured in dollars and cents, but if they could, we should consider them of a great deal more value.

Your committee when it first began work wrote letters to the different insurance companies requesting information so it could have facts to present to our legislators, without which it would have been impossible to get this bill passed. The company which has not raised its rates in Minnesota—the Medical Protective Company—was the only company that aided us in any way toward the passage of this bill. The others simply ignored our request. While I have no favorites as to insurance companies, it is only right that the medical men of Minnesota should know who helped us in our hour of need in getting legislation which we both desired and badly needed.

So far we have reported on constructive legislation, but what bothered us as much was destructive legislation. Through legislative friends we were able to learn of many proposed bills and on interviewing the man picked to introduce the bill, we were able to show him that such a law was not for the benefit of the people of the whole of Minnesota, but for the fostering of some special interest. Oftentimes a member is induced to introduce a bill by his home constituents that on the face of it looks harmless but has hidden teeth. And on your committee's explaining the bad features of it, they expressed surprise and I know of a couple of bills that died in committee at the suggestion of their author.

I may add that your committee spent a good deal of time here in preventing the following bills from being passed and I have no doubt but several of them would have slipped across if the matter had not been given personal attention:

The Chiropractic Bill, Senate File No. 282, reduced the course of instruction as it now stands from three years of eight months each to three years of six months each and in

addition permitted any chiropractor already licensed in any other state to be allowed to practice in Minnesota upon application and a small fee. While the bill limited chiropractors to manipulation of the spine and sounded all right, they probably would, in the end, do everything, as the chiropractors are now doing, and it would have opened all doors so that all kinds of poorly trained chiropractors who stood ready to enter the state and flood it, could have done so.

The Hospital Bill, Senate File 973. The passage of this bill was also fostered by the chiropractors and other cults. It would not only have permitted them to take their patients to hospitals, but would have given them the full use of x-ray machines, laboratories and the service of all trained employees of the hospital staffs, such as radiologists, laboratory men, etc., as well as ambulance service. This would apply to all city hospitals, the University Hospital, Phalen Park Hospital or any hospital in the state which receives full or partial aid from the city, county or state, in any way. This would likely have been an entering wedge for them to get entrance to all hospitals. This bill was actually recommended by the Public Health Committee of the Senate to pass, but was checked in the House.

The Contagious Hospital Bill, House File No. 850, which provided that a contagious hospital could not be erected within 1,500 feet of a public park, at first applied only to St. Louis County and as we were not looking after the hospitals in particular and heard nothing from the county to which it applied, the bill was passed as such, but vetoed by the governor.

Then the bill was re-introduced to apply to the whole state of Minnesota. Of this new bill we took notice and also the chairman of the Legislative Committee of St. Louis County came to St. Paul. In the fighting of this bill we took quite an active interest, after we saw what was going to happen. It slipped by the Public Health Committee of the House and was passed under suspension of the rules in the House,—before even the members themselves seemed to know what they had acted on, as it had gone through in such a hurry. The Senate Committee, which recommended anything and everything, recommended this also and we had it on our hands to fight and only got it disposed of the last night of the Session—about 12:00 o'clock. In spite of all our precautions and preparations, the last step of which we took that evening and during the night, in the excitement they pretty nearly slipped it over and would have if I had not been there fighting it.

The Anti-Vaccination Bill, Senate File No. 935, simply attempted to repeal a law which we have now which provides that unvaccinated children may be excluded from school during an epidemic of smallpox. The bill was recommended not to pass by the Committee of the House, although the Senate Committee had recommended it.

The Anti-Vivisection Bill, Senate File No. 1160, would have prohibited—you might say—all experimental work on animals and simply put our medical schools in a position where their hands would have been tied. On a public hearing of this bill it may surprise you to know that the House chamber was so filled, including the galleries, that there was barely standing room and the halls were jammed with people who applauded the proponents of the bill and

more or less jeered the opposition. I had not believed there were so many nuts in the Twin Cities as I saw there. However, a public hearing, I may tell you confidentially, is only, as far as the legislators are concerned, a public show, at which everybody can shoot his fireworks, and I think these cults especially enjoy it.

The Naturopathists Bill, Senate File 1146. The Naturopathists are simply a new cult that seemed to have all the knowledge of all the other cults,—besides several new additions. Their chief claim, however, is that they are going to cure everything without medicine. Even this bill, as unreasonable as it seems to us, had its friends, who tried two or three different times to get it raised that it might be passed.

The Full-Time State Employees Bill, Senate File 1064, provided that any employee of the state on full time who did any outside work for which he was paid would have to give the money thus earned to the state. This would have affected our medical men at the University and some of our profession at the state institutions like the Insane Asylums. However, its author, when his attention was called to what it would mean, was kind enough to let it go to sleep.

I wish to call your attention to a bill known as the Reed-Johnson Bill—which looks to me like the beginning of the boldest attempt to socialize our profession,—as passed by the National Congress in the last Session during the closing hours.

This bill provides that any ex-soldier, including those who took part in the Spanish American War, the Boxer Rebellion and the World War, may receive from the government irrespective of relation to service or ability to pay:

1. Free medical examination.
2. Free medical and surgical treatment.
3. Free hospitalization.
4. Transportation and all traveling expenses.
5. Full pay during the time he is traveling and during examination and treatment.

This bill will be discussed by Dr. Carl B. Drake.

Your committee found in the beginning that there was very little organization to give us help from the medical profession, even though we had so called legislative committees, as so many of them were dead and not functioning. Out of some sixty-five letters sent out to members of Legislative Committees, Secretaries, etc.—letters were sent to those whom we believed to be the most live ones in the profession—only fifteen replies were received and some of these too late to do us much good. However, as things progressed and we kept bombarding members with letters, long distance telephone messages and telegrams, they began to wake up more and more, especially in the Twin Cities and other large cities in the state, and became quite active, due largely to the more active interest taken by their legislative committees. Our records show that the Upper Mississippi Valley Society was the first of the country societies to take a real active interest in the legislative work, followed closely by the Blue Earth Valley Society, and for the work they did they should be highly complimented. There were other men through the state, some on committees and some who were not, who were very efficient and a great deal of credit is due them.

A word about our legislators: I cannot help but feel that our legislators, as a class, are greatly misunderstood. Instead of being what the newspapers make them out to be, men who just idle away their time and pass anything that comes up before them, I want to tell you they are hard-working, earnest, able men, as hard-working and underpaid a class of men as I know of; in fact they are the outstanding men of their communities,—otherwise they would not be here. They are the type of men we must show that what we ask for is right, which is as it should be.

The fact is they do not understand medical legislation, any more than we would understand legislation for some other scientific body, but they apparently are appreciative of being informed along this line and I do not feel that the Medical Association need hesitate to keep a man in St. Paul during the session to properly inform our legislators in regard to our stand on different bills.

The Legislative Committee appreciated the valuable aid, assistance and advice which was always willingly and cheerfully given by former chairmen of the State Legislative Committee—Doctors J. T. Christison and F. J. Savage. We followed in their footsteps and continued the work along the lines which they had worked out. It was certainly along the right lines and it is absolutely necessary to have good legislative committees, as this makes it easier to get direct contact between doctors and their senators and representatives.

In order to get legislation the committee must have great freedom of action—in fact they must practically have power to act as they see fit and then be responsible for the result—which to the credit of your President, Dr. W. L. Burnap, he gave your Legislative Committee; not only that, but his advice was freely given and his presence and aid here many times to encourage us in our work was surely appreciated.

I feel that our medical men should take more interest in politics, especially as to legislators, and that for legislative purposes the state should be re-districted so the districts will be the same as the legislative districts,—which generally are represented by one senator and two representatives—that the family physician of every senator and representative be known and if possible on the legislative committee. This is a direct personal contact which should not be overlooked. That the society should raise its dues not less than \$3.00 to \$5.00 per year, so they will have money to keep a man in St. Paul—who should be a regular practicing physician—during the entire session and that he be given wide powers. While my time is being donated to the Association by myself and firm, you can probably not often get a man to do this usually and you should be prepared to pay him, and then allow him a liberal expense account. There is nothing our legislators detest as much as a tightwad, as they are not tightwads themselves. A good many of our legislators spend a thousand dollars more than they are paid, their salaries being only \$1,000,—at least so they tell me and I have every reason to believe it is true.

Your representative must be very carefully chosen, for if they don't like a lobbyist they hold it against what he represents and take no interest in it. Many men doing lobbying here do their cause more harm than good. I would suggest that the representative stay in the hotel which is the political headquarters and where most of our

legislators stay, that he have an office room and a stenographer there, as we have done during this session.

The place to do such work is not at the Capitol, but from your headquarters. Legislation is not obtained by buttonholing every man, but by getting legislators and senators to do work for you, in looking after the interests you represent. If they like you, they are like other men, they will go out of their way to do you favors and help your cause—if they don't, you are up against a stone wall and you might as well pack up and go home.

The reason I am recommending and urging these things so strongly upon you is that there was more cult work and there were more cult bills introduced this session than at any previous session. There were other bills which were prevented from being introduced by our presence there. For instance, the chiropractors had begun during the campaign to make arrangements for having a bill introduced which would give them the right to take care of contagious diseases, sign birth and death certificates, and possibly do obstetrics. The prevention of the passage of such a bill could only be valued in millions of dollars to the real profession.

We simply are at the turn of the road—either we must get ready to do business in a practical way or be walked over by this class of cults. The chiropractors were putting up from \$25.00 to \$100.00 apiece for legislative purposes, but if we go after things and do them along the lines I have suggested, do them, not think about doing them, I think we can simply dictate for them such laws and rights to which their training entitles them and no more.

We wound up the passage of our bill with a banquet at the Minnesota Club, to which were invited the governor, lieutenant governor, speaker of the House and the authors of our bill, as well as the professional members of the House. It also was attended by members of the Legislative Committees in the Twin Cities and nearby towns as well as doctor friends of the authors from different parts of the state. Speeches were made by all our guests and a good many of the doctors. The banquet was a very informal affair, but everybody seemed to enjoy himself and I feel I can assure you that the Medical Association is on the map, as far as our legislators are concerned, and that all we have to do is to watch our footsteps and do things in a practical way, as they should be done. As long as we do this the Medical Association of Minnesota will stay on the map.

As to the members of the Legislative Committee of the state, I wish to state that Dr. Theo. Bratrud spent quite a little time here and it was his intention to spend a good deal more, but owing to being called away into court to help prosecute some quack and on account of sickness, he was unable to be here as much as he wished, but his work must not be forgotten and should be highly appreciated.

Dr. C. B. Wright, of Minneapolis, looked after the Minneapolis men and never failed to respond to the call of duty, whether it was during the day or in the middle of the night, as oftentimes occurred.

Dr. C. L. Scofield, our honorary member of the committee, did everything he was called upon to do.

The secretary of our committee, Dr. E. A. Meyerding, aided us at any and all times as much as he possibly could, cheerfully and willingly.

I can only pay the highest compliment to the willing and intelligent work of the different members of our committee.

When I speak about millions, I do not want you to think I am flighty, because when you figure, say 3,000 men in the state of Minnesota, just the small sum of from \$25.00 to a few hundred dollars on an average being annually taken away from these different men by the cults or by ambulance chasing lawyers, how long does it take to run up into millions?

The trouble with the Medical Association is this, we are a great body of men—we are a great corporation—and the thing that affects the individual only in a small way represents millions of dollars when you consider the whole body of medical men in the state, therefore we must not consider a few dollars when it comes to expenses in getting protection for our members but regard this slight amount that you add to your dues as a small insurance premium that you are paying to protect your business. We are donating to everybody else,—why should we not donate a little to ourselves?

We make this appeal to you, not for personal reasons, because most of us are old and might be able to live without being actively engaged in the practice of medicine, but more for the younger men who are entering the profession and whose future welfare depends more or less upon what we do today, as a good beginning in protecting ourselves and putting our Association on a business basis. I would hate to have our younger men say some day that if we older men had only been more farsighted and taken the proper steps before it was too late, we would not have been placed in the position that we now are,—which might be social medicine.

Therefore, your Committee on Public Policy and Legislation makes the following recommendations:

1. That our medical men take more interest in politics—especially as to members of the House and Senate; that for legislative purposes the state be re-districted to correspond to the legislative districts; that the legislative committee of the state shall have power to appoint in each legislative district a representative to co-operate more or less with the local society, but who shall be in direct contact with and be responsible to the state legislative committee.

2. That the Reed-Johnson Bill be taken up with the American Medical Association through our representatives. That we be ready to co-operate with them in national legislation; that the State Medical Association should have the money and be prepared to contribute its share to the expense in looking after national legislation.

3. Recognizing the necessity which confronts the medical profession of the state, for maintaining a physician at the Capitol during the session of the legislature, to look after our interests during this period, that a fund be created for this purpose by raising the dues of each member of the Association the sum of three dollars (\$3.00)—this in addition to the present regular dues.

4. That if it is decided to take an interest in national legislation, two dollars (\$2.00) more be added to our dues,

for the purpose, so that Minnesota will be in position to take interest in national legislation.

Respectfully submitted,

H. M. JOHNSON,
Chairman.
E. A. MEYERDING,
Secretary.
THEO. BRATRUD,
Warren.
C. B. WRIGHT,
Minneapolis.
C. L. SCOFIELD,
Benson.

THE CHAIRMAN: I want to stop for a minute if you don't mind and call for another report. There is one able lieutenant that Dr. Johnson and this committee had, who is the chairman of the dental committee on legislation, who co-operated in a wonderful way. We have asked him to come over here just a minute and give us a word. So I will call on Dr. Naegeli now.

DR. WM. C. NAEGLI (Minneapolis): As your President said, I am simply a second lieutenant. I have been working under the general over there during this whole legislative period, and due to modesty on his part he asked me to bring up certain things that we have been bumping up against all the time over there. One of them is to bump up against a man, a legislator, whom we can't get in touch with either through the dentist or through the physician. As it happened, some men Dr. Johnson could not get in touch with directly through the family physician—or there was no family physician in the case—we were able to get in touch with through the dentist. Due to that condition coming up again and again and due to the fact that we have more or less common interests—wondered whether it would not be a good thing for the chairman of the medical legislative committee and the chairman of the dental legislative committee to work together in harmony. That's what we did in the past; without any official sanction from any of the bodies we worked together. Whenever Dr. Johnson wanted me to get in touch with any men to convince them to work for your bill, we did so. Likewise if any of our bills came up and there were men that he was able to get in touch with, he did that for us. We found that interlocking that way helped out both of us.

The question of raising dues and having a common fund is important. Now I was placed in the position over there without any funds. I was told in a roundabout way that I might get money and I might not. But as Dr. Johnson says, the legislators hate a cheapskate. The only time you can get them is to take them out to supper when they have a few minutes of leisure. If you try to buttonhole them at the Capitol you are simply hurting your own cause. There is no question but that it is necessary to have a common office at their main headquarters and work through their headquarters. I suggested to Dr. Johnson that if you men favor it and you have a fund and we have a fund the expenses of that headquarters might be shared between the two societies, in that way lowering somewhat the expenses for each society. We could have a room in common, an office in common, just during that period of time, and that would save expense for all of us. I have spoken to the

officers of our society. They haven't had an official meeting in the house of delegates yet, but that will be one of the matters brought up, providing that you men take some action along that line and show any desire to co-operate.

Then the question of entering into politics. There were men that left the legislature and told us before they left that they were coming back in two years to put over some of the bills that they failed on this year, and that they were going to get out and work, and that they were indirectly going to try to get some of our friends out over there so that they wouldn't be back in office again. They are going to spend money to put that across. As far as the dentists are concerned, we know that advertisers have a fund a little better than six thousand dollars which is going in for political purposes. Now if we can't get out and combat that in some way so that we can get in touch with our senators and representatives before they are elected, if we are going to let the other man help them through politics and are going to sit back and watch them be put over and then afterwards ask them to give us some support, they are going to help the men that put them in office.

Then there is another question and that is showing some appreciation. Those legislators are just as human as the rest of us. We must show them appreciation for what they have done for us in the past, and not simply go over there and ask them to work on a bill for us and after the bill is over simply forget all about it. We have got to get out and let them know that we appreciate what they have done. It is up to the men in the home town, the family physician or the family dentist, to get over to see that man personally and shake hands with him and tell him that we appreciate what he has done for us. Dr. Johnson and I both found that they came to us and said, "Well, you fellows come back here every two years and you want something but you never do anything for us, and after we do something for you we never hear from you again." They get angry. One of the proposers of the bill for the statute of limitations said, "I don't feel like going on this bill. You fellows are asking for things and we go out and work and after we get through what do we get out of it? You don't even thank us for it."

Those are just a few of the little things that Dr. Johnson I know didn't care to speak of and he asked me to mention, things that we have been bumping against together all the time. There is nothing that Dr. Johnson and I would appreciate more than if it was possible to have the two legislative committees work together and have a common fund or have a fund so that the chairmen could draw on it for the benefit of both, and if we had more than we needed and you fellows needed any help, why our money could go over and help you men. I know that you men have more bills coming up every year than we do, but every bill that affects you, as I said at the beginning, will affect the dentists. You can't get away from it. Some way or other it will affect us. We even suggested further that it might be possible to get the assistance of the pharmacists and perhaps hospitals to work together, because what affects one is going to affect all. Of course Dr. Johnson says the increase in the cults and quacks of every kind is getting stronger year after year. Unless we get out politically and help

our senators and legislators they are going to slip bills over on us; and we are not going to have Dr. Johnson over there all the time to stop things as we have had this year.

THE CHAIRMAN: I would like to call on Dr. Christison, who has worked a long time on this same line of work, for some remarks.

DR. J. T. CHRISTISON (St. Paul): I don't quite understand why the President calls on me to make remarks about this legislative material. Those of you who were in the House of Delegates last year may remember that in my report as chairman of the legislative committee last year I strongly recommended that a full time man be appointed. Having been chairman and member of legislative committees for a good many years and having been in touch with legislative committees of the medical societies of other states where that obtains, I realized the importance of such a measure. Little did I dream, however, that we were going to have a man like Herman Johnson who would come down here from Dawson and camp on the trail of those legislators and spend his money and call us up at six o'clock in the morning or twelve or one o'clock at night, whenever the fancy moved him, and say now you get busy on this or get busy on that. I think Dr. Savage will bear me out when I say that when Johnson said get busy we got busy.

The results speak for themselves. I am not going to try to tell you what has been accomplished or how it was accomplished, but I want you to carry this one point away with you: keep in mind that all these chiropractors and all these osteopaths and all these naturopaths, or whatever they call them, are all making a living; the people they are treating, under whatever guise, should by all rights belong to you and to me. I appeared before the committee of the house and ended my remarks up there that night by saying that the first mistake the state legislature made was to dignify the osteopath and chiropractor with a board of examiners. Now unless we have someone on the ground who has or will make a number of friends in the legislature, and unless we are willing to spend some money to do it—because you have got to do it in order to accomplish results—we are not going to get anywhere. The bills that were killed this year mean a lot more or at least quite as much as the one that was passed, and those bills are coming up periodically. They have paid men who go before the committee and ask for public hearing and take up the time of those men. It is true it doesn't mean very much to them personally but they have got to make a showing.

Each one of us must resolve himself into a committee of one, if you please, to see to it that we don't lose sight of the fact that the doctor's business is to get into politics a little bit and find out what manner of man is going to represent him in the legislative hall. Understand this: these gentlemen of the legislature are not a common herd of men, not by any means. They are gentlemen of the first water, at least the majority of them are. They are men that you are glad to meet, glad to sit down and have dinner or luncheon with, and that's the only way that you can get their ear. You go up to the Capitol and say to Representative Peterson or Representative Johnson, "I want to talk to you for five minutes"; you might just as well stay home. You have got to invite these men to little

gatherings here, little gatherings there, and talk to them and show them your point of view. Don't ask anything that is unreasonable but let them understand that you are asking for only what is right and you will get them every time.

DR. C. B. WRIGHT (Minneapolis): As a member of this committee, which was my first experience in legislative matters, there is another point that Dr. Christison didn't emphasize and that is this: No matter how good the full time man we have, no matter how bright or how capable he is, there is one thing that he is going to miss that Dr. Johnson didn't, and that is that he lived with these men. In my opinion that is the way he accomplished his purpose. I have talked to him a lot and I know that he spent night after night in these men's rooms and they in his room until twelve and one o'clock talking not over medical legislation alone but over every type of legislation. I happen to know that his advice was often asked on important legislation which had nothing to do with medicine but which is very important to every citizen of the state of Minnesota. For instance this reorganization bill. I know that a lot of men came in and discussed it with him, and that he was at a number of meetings at which this thing was discussed in a very private and quiet way. I believe that that is the most important thing of all.

Now Dr. Johnson of course has done something which very few men would do, and that is for three months to go to a hotel, hire a couple of rooms, have a stenographer, invite these men in and talk to them every night, dine with them, spend his whole time hobnobbing with these men. He made a lot of friends. He made a lot of friends for the medical profession. I learned something there. In addition to having a full time man for this particular purpose I am thoroughly sold to the idea of having a man from the country. The average city doctor and the average city man doesn't know the psychology of the country legislator. I think as a rule they look down upon him. They think he is a man of inferior ability. Because he may not wear the latest cut of clothes or because he doesn't have the latest form of slang, they think he is a man of inferior intelligence. In my opinion the country legislator is a more intelligent man as a rule than the type of legislator that represents us from the cities because in the country going to the legislature is looked upon as an honor. Those men feel their responsibility, and although they may not be informed on all of the things with which they are dealing still they give them very sincere consideration. The men in the cities I am sorry to say are not the best men in the community, nine times out of ten. There are very few big men in the cities who will go to the legislature; they don't want to be bothered. We are represented to a large extent by the ambulance-chasing attorney who is anxious to get into the legislature because he knows that he can get through stuff and can make friends and do things for which he gets some notoriety and some prestige.

Therefore I thoroughly approve of this method of having a man in addition to our full time man if we can possibly do it. I hope Dr. Johnson will do it again. I am thoroughly sold to this idea that to get legislation you have got to have someone who knows the psychology and who knows the importance of how to approach these men.

THE CHAIRMAN: Any further remarks now? There is one thing we should call your attention to in regard to adopting this report and that is it involves a financial matter. He recommends an increase of three dollars in one case and five dollars in the other. As we interpret our Constitution the House of Delegates can do that by a four-fifths vote if you desire to increase these dues, but it should be referred to our Finance Committee of the Council and be acted on later. Now I don't know just exactly how you want to proceed with that. We could adopt it outside and bring it up tomorrow.

DR. F. J. SAVAGE (St. Paul): If I might be permitted to modify that motion in order to bring out the object of this increase, I would like to modify that in this way: "That this increase in dues be used for the creation of a fund to be known as the Public Health and Legislative Fund; that this fund be used at the discretion of the Council for maintaining a representative of the medical profession in St. Paul during the session of the legislature, and for such publicity and public health education work as the Council may determine." That simply specifies what this increase is to be used for.

Motion seconded.

DR. W. A. COVENTRY (Duluth): I would like to ask how much you are going to increase the dues according to this motion. You said three to five dollars. I think a blanket increase in dues ought to go before the Council. Those recommendations according to my understanding should be referred to the proper committee. What they suggest or recommend I am in favor of, but I think this blanket way of slipping them along is very indefinite and doesn't get us anywhere.

DR. C. C. BELL (St. Paul): This is certainly a very important matter. Why not leave it until our next meeting so that we may have time to think the matter over? I think we are all in favor in a general way of the proposition but it is a very important matter when it comes to taxing every member of the state society three to five dollars. I think we should give some consideration to it. For that reason I suggest that we refer the matter over until our next meeting.

DR. C. B. WRIGHT: I would like to amend that motion if I may, that this be referred to the Council for consideration and referred back to us tomorrow.

THE CHAIRMAN: Did anyone second that amendment?

DR. COVENTRY: May I ask: Refer the whole report or the recommendations? I will second the motion if it means the recommendations to be referred to the Council and referred back to us and the report to be accepted as read.

DR. L. SOGGE (Windom): I would like to know what you intend to do with the medical defense before we vote on that and also the full time secretary. We ought to make some provision there. If we arrange five dollars dues here now and then have to raise them for the secretary it is going to be pretty hard to come back to our society and tell them that the dues have been raised that much. I think we ought to go a little careful.

Motion carried as amended.

Report of the Committee on Hospitals and Medical Education was read by Dr. N. O. Pearce:

Your Committee on Hospitals and Medical Education has had several meetings. The work of the committee has consisted of investigations of hospitals applying for registration on the accredited list for interns.

Up to this time, the hospitals under consideration have been St. John's of St. Paul, the Fairview Hospital of Minneapolis, and St. Luke's Hospital of Duluth. This work has necessitated the personal inspection of these hospitals by members of the committee and much correspondence with the Council on Medical Education and Hospitals of the American Medical Association.

Further the committee has followed out the suggestions of Dr. Litzenberg, formerly chairman of this committee, in his last annual report relative to the extension courses. A plan has been evolved as a joint enterprise between the Minnesota State Medical Society and the Medical School of the University of Minnesota, the administration end of the program to be carried out by the Extension Division of the University of Minnesota. It is the intention of the committee to offer this course in two centers, at first, with the idea of getting the details worked out before attempting to offer it generally throughout the state. Your president, Dr. Burnap, asked that the course first begin at Fergus Falls, and the necessary group of men have signed up for the course at this point. We are more recently informed that Moorhead has also perfected their arrangements and have approximately 40 men ready to attend. These two adjoining centers will furnish an ideal tryout for the plan.

Through our secretary, Dr. Meyerding, copies of this plan have been forwarded to the secretaries of all the county societies. The details of this plan are being worked out by a joint effort of your Health and Hospital Committee and the Committee on Short Courses of the Medical School, and it is their intention to select different groups of clinicians for each course as long as suitable men are obtainable.

At the last meeting of the House of Delegates, \$100.00 was voted towards preliminary expenses in organizing this work. While this has not been drawn to date, a good portion of it has been spent, and it is the desire of the committee, if the House of Delegates wish this work to be carried on, that they appropriate a similar sum for the committee's use next year.

Respectfully submitted,

N. O. PEARCE,
Chairman.

THE CHAIRMAN: Now we have heard this report, and I can say that it was greatly appreciated by the places where it was offered. I would like to ask O. J. Hagen to tell how he got along up there at Moorhead.

DR. O. J. HAGEN (Moorhead): All I have to say is that we got the reports sent out from the Extension Committee and they asked us if we would take it, and we went on and took it. Up to the present time forty-five men have signed up, and I think they are going to enjoy it because they are going to get some good stuff.

THE CHAIRMAN: I think to have forty-five men signed up in three or four days is something big.

DR. BRAASCH: I move that the report be adopted, except the financial recommendation, which will be referred to the Finance Committee of the Council.

Motion carried.

Report of the Committee on Substitute Medical Defense was read by Dr. E. Starr Judd:

To the President, Officers and Members of the House of

Delegates of the Minnesota State Medical Association:

I have the honor to submit herewith Report of your Committee on Substitute Medical Defense.

This committee has diligently made every effort to obtain all information possible and has considered the same carefully. The chairman and secretary by correspondence investigated the method of insurance in practically every state that has some form of medical defense. The chairman and secretary in addition visited the office of the American Medical Association, and discussed with those familiar with this subject the question at hand. A synopsis of this information has been submitted to all members of the committee for their study, also to all members of the council, and a copy is attached. The detailed information obtained is on file in the office of the secretary of this Association and may be seen upon application.

The committee called in Mr. Theo. Engstrom and Mr. Caldwell, representatives of the Aetna Insurance Company, to give further details concerning the group insurance plan, and also Mr. W. H. Oppenheimer, attorney for the Minnesota State Medical Association. These gentlemen discussed at length the questions in hand.

The chairman of this committee desires to commend to you the members of his committee for their zeal and interest in investigating this matter and attending meetings of the committee.

We submit herewith the following:

Sample copy of Physicians' and Surgeons' Liability Policy of the Aetna Life Insurance Company.

Letter from Aetna Insurance Company explaining details of contract.

Legal analysis of Mr. W. H. Oppenheimer of the Aetna contract.

Synopsis of material collected in investigation of medical defense in other medical societies.

RECOMMENDATIONS

The following are the Recommendations submitted herewith to the House of Delegates: (Explanation—Words in Capitals are new):

That the following be amended to read as follows:

Chapter XI—Medical Defense.

Section 1. The Council, with the advice and consent of the House of Delegates, shall make a contract (or shall be authorized by the House of Delegates to make a contract) with an insurance company for group insurance for the Minnesota State Medical Association for malpractice suits. Each member shall pay for the policy he selects. This group shall be known as "Group A."

Section 2. Active members of the Minnesota State Medical Association who do not wish to take group insurance, and who have paid all dues, assessments, and other charges assessed or levied by the Minnesota State Medical Association by paying \$5.00 per year in advance shall be entitled,

on conditions hereinafter specified, to receive, without personal expense therefor, legal advice and court service of an attorney or attorneys-at-law in the employ of the Association, witness fees for the purpose of conducting their defense in any court in this state, when they are accused of malpractice, or of illegal transactions in connection and the commitment of persons to institutions for the insane. This group shall be known as "Group B."

Section 3. Members not subscribing to the group insurance plan nor to the medical defense plan must defend themselves entirely at their own expense.

Section 4. It shall be the duty of the Council, severally or collectively, to investigate all claims of malpractice against members, to adjust such claims in accordance with equity where possible, and, if in their judgment an adjustment is impossible, or the claim is unjust, or the damage sought is excessive, to tender such help, aid, and counsel as they may see fit. They shall be empowered to contract with a member of the bar of Minnesota as legal counsel of this Association.

Section 5. The Council shall make an annual report to the House of Delegates at the annual meeting for the year previous ending December 31st. This report shall contain an enumeration of all suits or threatened suits for malpractice against members of the Minnesota State Medical Association which have been properly presented to them for action.

Section 6. The legal services herein provided for shall be granted only on the following conditions:

First: Any active member in Group B desiring to apply for malpractice defense hereby provided, shall immediately upon receipt thereof send to the secretary of the Minnesota State Medical Association, any letter, process of court, or other evidence of threatened litigation in connection with such malpractice case.

Second: It shall be the duty of the secretary to forthwith examine the financial records of the Minnesota State Medical Association, and if such member so applying is found to have paid all arrearages, dues, or other charges due the Minnesota State Medical Association for the year, he shall certify those facts to the Council of the Minnesota State Medical Association, and forthwith send to such Council the papers received from such applicant for defense, and such secretary shall forthwith return to the applicant, if he shall find that the applicant has paid all the arrearages due the Minnesota State Medical Association, a formal application for defense containing authority for the said Association through its attorney to defend the action and granting to the Association and its attorney sole power to conduct the defense thereof, and agreeing not to compromise or settle said claim for damages for said alleged malpractice without the consent of the Minnesota State Medical Association or its attorney. The said applicant shall furnish and return to the secretary with his application duly executed, a full, accurate, and complete history of his treatment of the case out of which the alleged malpractice arose, giving dates, names of witnesses, nurses, and other attendants, all of which information shall, upon its receipt by him, be forwarded by the secretary of the Minnesota State Medical Association to the Council of the Association.

Third: If, on the other hand, the secretary finds that any member in Group B so applying has not paid all arrearages as herein specified, then and in that case, he shall return at once to the applicant all papers or memoranda received by him from said applicant together with a statement that he is not entitled to defense and the reason therefor.

Fourth: It is further understood between each and every member of the Minnesota State Medical Association that under no condition or contingency will the Minnesota State Medical Association pay any sums awarded in settlement, compromise, or by any verdict against any member sued for alleged malpractice, and each member applying for the services of the attorney of the Association in any malpractice case, shall agree not to obligate in any manner the Minnesota State Medical Association or any persons connected therewith to the payment of any sums whatsoever for any purpose.

Fifth: The Minnesota State Medical Association will assume the defense in a suit for malpractice against a member of Group B only while he is such and when the alleged malpractice occurred subsequent to May 1st, 1925, and to the date on which the member joined the Association.

Sixth: The Association may decline to defend an action, where the claim of malpractice is entered as a defense to a suit for a bill, unless the attempt to collect the bill by suit is made within one year after the services were rendered.

Seventh: This chapter shall be in force on and after July 1st, 1925, and the year shall end on the last day of December of each year.

Respectfully submitted,

COMMITTEE ON SUBSTITUTE MEDICAL DEFENSE,

E. Starr Judd, M.D., Chairman,
E. A. Meyerding, M.D., Sec.,
H. Longstreet Taylor, M.D.,
O. Th. Sherping, M.D.,
E. H. Smith, M.D.,
F. P. Strathern, M.D.

THE CHAIRMAN: Now you have heard of the committee, what is the wish of the House of Delegates?

DR. F. J. PLONDKE (St. Paul): I would like to ask what they will do with those men who have paid their dues up to this time who discontinue their insurance in the state society when they take out say the Aetna policy. What I mean is, say for example that I have had state protection up to this time. Suppose I have a suit brought against me some time during the next five years for something that I did in the last year, would the state continue to defend me or not on that account?

DR. JUDD: The state association is not liable.

DR. PLONDKE: No, the state is not liable but they are morally under obligation to do it. Now it is a question of whether we are going to drop this man right now—I am not talking for myself because I have additional protection, but I don't think that we have any right to drop that man at the present time and let him go without protection for the next five years.

THE CHAIRMAN: Well, what is your point? What do you suggest?

DR. PLONDKE: That the state should continue to defend him. That is the only thing we can morally do.

THE SECRETARY: For anything he has done up to date. You say six years for anything he has done up to this date.

DR. PLONDKE: Yes, up to this date, not in the future. Say if I drop my policy now, then of course the state is no longer under obligation to defend me but they are under moral obligation to defend me for the time of the statute of limitations, which I understand is six years.

VOICES: Two years.

DR. PLONDKE: I have investigated and I may be wrong. Someone said at a meeting the other day that Mr. Oppenheimer said it was only for two years. Mr. Johnson can tell us about that, but as I understand it that two years statute of limitations is not read rightly. I believe it goes into effect some time in June, and anything that is brought from that time on is two years and anything that has happened prior to that time is six years. I may be wrong on that but I don't believe that bill is read aright.

DR. JOHNSON: The bill takes effect three months after it was passed. It was passed the 27th of March at five o'clock. From then on no action can be instituted except within two years.

DR. PLONDKE: Yes; Dr. Johnson, what I had reference to, is that retroactive? Suppose I do something today that they will bring suit for after the 27th of June, can that only go for two years or is it for six years?

DR. JOHNSON: Six years.

DR. PLONDKE: I saw that bill as originally drafted and unless it has been redrafted that does not hold after two years.

DR. JUDD: Mr. Chairman, we had considerable discussion in our committee on just that point and so we got Mr. Oppenheimer. His opinion was that it went into effect immediately.

DR. PLONDKE: Well, whatever it may be, I think we are morally under obligation to defend them.

THE CHAIRMAN: I wonder if we should have a motion first before we discuss it?

DR. WORKMAN: I move that the report as made be adopted.

Motion seconded.

DR. C. B. WRIGHT: Isn't it true that a man has his legal rights? It isn't a question of moral right; it is a question of legal right to that extent. If we are obligated under this defense bill won't we continue to be just the same according to the statute? It isn't a question for us to discuss. We will have to defend or we will have to provide that protection which we have agreed to provide in so far as the law requires it, won't we, no matter what we do here?

THE SECRETARY: The opinion of Mr. Oppenheimer is that it stops when we pass the motion. We can stop it any time legally.

DR. J. FRANK CORBETT (Minneapolis): It seems to me that right at this minute we cannot terminate our present plan of insurance, otherwise it is inevitable that men will be left high and dry. If it is in order I would like to put an amendment to that: That we continue our present protection for two years and then after that stop it.

DR. JUDD: If we do that we will have to provide some more funds because we are pretty near broke in the society now. We can't go on the rest of the year; we have used all the money we have had. We will have to assess the society if we do that.

DR. BRAASCH: It seems to me that we ought to face this issue right squarely and say whether or not we will continue medical defense in the future. We can't do measures half way. We either should defend our members wholly and heartily and combine to defend them against legal suit or we ought to cut loose and not hold ourselves morally responsible for this purpose. It seems to me it is wrong in the first place that we are banded together to defend a man right or wrong. Furthermore, it puts us in the eyes of the public in the wrong light. Our purpose is different from that surely. Our purpose is for higher things than commercial gain. It seems to me that our men are fully protected by group insurance without our backing. It puts us in the wrong light before the public. Our dues are high enough as it is, and what we should do is to devote our funds to other purposes which will help us a good deal more: the purposes of education, such as Dr. Pearce has introduced; the purposes of legislation, such as Dr. Johnson has introduced; and half a dozen other things which would be of far greater importance than medical defense.

Therefore I move you that this report be amended, that the second clause be stricken from it, and that we take no further steps in medical defense. If we carry on the second class I am quite certain that we will be responsible just as we have been before, that the expenses will be the same. It has been claimed that probably a thousand members will take advantage of this Class B. I personally question it, and one man's opinion is as good as another's. But supposing there are only two or three hundred, \$3,500 was our bill last year, this year something like \$4,000, and it will be increasing. In other words, we will be paying our dues, all of us, for the defense of a certain small group, and it will be inadequate protection besides. Therefore, Mr. Chairman, as I said before, I make the amendment, and I hope this society will take radical steps and free ourselves from this thing once and forever.

Dr. Braasch's amendment seconded.

DR. F. L. ADAIR (Minneapolis): I agree heartily with Dr. Braasch. I think this society ought not to go into insurance features where we are the underwriters. In insurance of that type it is pretty difficult to calculate the cost. I think it is quite all right for this society to make arrangements for group insurance which it can offer its members, but for the society to undertake any longer to protect its members against malpractice suits I think is unwise.

DR. PLONDKE: I agree absolutely with Dr. Braasch. I never did think that the state society ought to meddle with insurance, but I still think, think more than ever, that we ought to protect those men who have had this insurance with us. We insured them for six years when we took their money, insured them for during the time of the statute of limitations. I am perfectly willing to discontinue the insurance according to Dr. Braasch's motion, but I do think that we ought to protect these men during the time of the statute of limitations.

DR. COVENTRY: According to Section I as suggested by the committee we may contract with an insurance company for group insurance. It seems to me that we could eliminate that and let every man carry his own insurance and forget about the medical defense entirely. If you adopt the report it seems to me you bind the society to make a contract with some insurance company for group insurance. Most of us already carry insurance. Now does that make it binding on every man to take this insurance? You give them an option on your report; but now you cut out the second clause and you don't have any option, you just take what they offer you.

THE CHAIRMAN: I will call on Dr. Judd. As I understand it, we have the privilege of taking Class A.

DR. JUDD: Yes; you are not obliged to take that at all. That is just a contract made with the individual. We just suggested that and recommended it to the members of the society. It doesn't make any difference how many members of the society take it; this company will issue a policy no matter how many members take it. They will give it to any members of the society who want it.

DR. SOCCE: Does it make any difference in the rate?

DR. JUDD: No, it doesn't make any difference; just the same no matter how many take it.

DR. TAYLOR: As a member of this committee I would like to say a few words in explanation. This contract that the Aetna offers us provides that the society shall have a voice in the choice of the attorneys, and they propose to take the same firm that we have been using in the past, men who are experts in malpractice work. It does get the policy cheaper for the individual members who take it than they can go out and get it for themselves. The policy runs to the society, but each man holds a copy. Every man who takes it gets a copy, but there is no obligation upon anybody to take it.

In regard to the Class B men who are to pay five dollars for simply the offices of the attorney and witnesses in their cases I would like to call your attention to this line out of the second article of our Constitution which defines the purposes of this Minnesota State Medical Association. One of these is "to guard and foster the material interests of its members and to protect them against imposition." Now I feel that there are a large number of members of this society who should be protected by the society from malpractice cases. Men who are not expecting them, who are possibly not practicing surgery and are not much given to having malpractice suits, might be caught unawares, and it would be most disastrous to them and their families if such a thing should happen. I believe that a state society that is going to be successful must do things for its members, must offer its members some material reasons for remaining in its ranks. The five dollars that these men paid would in all probability meet all the requirements. We would not as Dr. Braasch suggested be responsible for any except the gentlemen who paid for their defense. We would not be responsible for the defense of the others, and consequently the bill that would have to be met for attorneys' fees must be greatly diminished by the number of men that would take it. The protection offered by the group insurance pays also any possible verdicts that may be rendered against them.

I believe that it will materially increase the interest in the society. It will hold the men together, and it will be a good thing for all of us and it won't cost us anything. Every man would pay for what he gets. Those who want to pay \$21 or \$28 for the group insurance will get that defense from Oppenheimer and in addition will have all judgments paid; those who pay the \$5 will get Oppenheimer's defense just the same as the others do, and in that way we will be defending our members against imposition that many of them might not be far-sighted enough to have defended themselves against by taking out group insurance. I do hope that you will not turn down this clause without very serious consideration.

THE CHAIRMAN: I would like to ask if they all have it clearly in mind what these A, B and C Classes are? Is there anyone who is hazy on that at all, so that we don't do anything we don't understand? This amendment is that we cut out Class B. Now are there any more remarks?

DR. TAYLOR: It would be very nice if we could hear from Dr. Woodward who is here from Chicago.

DR. W. C. WOODWARD (Chicago): I have listened to the report that has been read and to the discussion that has taken place with a great deal of interest. I want to impress on the House of Delegates one feature of medical defense: that is not always realized, and that is the extent to which the entire profession is interested in medical defense. Medical defense has been viewed by all of those who have spoken as something in the interest of the individual. I don't look on it strictly as defense of the individual. I look on it as defense of the medical profession. Every malpractice suit that is entered, every malpractice suit that is won, discredits the medical profession in the eyes of the participants, the judge, the jury, the court auditors, and the readers of the newspapers in so far as they are acquainted with it. Now if I were employed by the chiropractors or by the osteopaths or by the naturopaths or by a group of that kind, I should make it my business to collect systematically the malpractice suits that are entered against the physicians of the country and exploit them publicly and particularly before the legislatures as a means of showing that chiropractors and the others were needed. I think we must defend the profession, not merely the individual. I think a medical defense committee can do that better than any other agency of any national or state association.

I believe one prime object of a medical defense committee is the ascertaining of the causes of these malpractice suits and the formulation of means that will limit such suits as far as possible. Now it is a matter of general belief among those who have studied the situation that most malpractice suits have their origin in some careless remark by physicians who are called into the case after some previous physician has been dismissed or has dropped out for some reason or another. Nobody can ascertain the actual facts of those cases better than a medical defense committee of a medical society, and if they find that that is the cause of many of our suits nobody can take preventive measures better than can the state medical society. For those reasons it seems to me that a medical defense committee has a very definite function.

When we speak of medical defense now we mustn't consider, it seems to me, the matter of court defense. I am

impressed with the idea that you can't defend a physician who has made a mistake better than by helping him to settle on the best terms that are possible and keeping him out of court, and there is no one who can judge on that in a fair and impartial manner better than the proper officers or committees of a medical society. A claim is made against one of your members and he refers the matter to your medical defense committee. The medical defense committee, after consulting the experts who are members of the society, find that the man against whom the claim has been made is likely to lose out in court, and they can do him no greater kindness than to defend him by saying, "You had better settle and we will help you to adjust the matter as best you can." That's medical defense.

Now when a medical defense committee is operating in that broad way and it becomes known, as it will through underground channels, that the society is fair, the society is just, when that becomes known and a case goes into the court with the backing of the society, again through this same general atmosphere that will pervade any community, the knowledge that it is going into court with the backing of the society gives the impression, the feeling among the court and the judge and the jurors who happen to know of it—you can't impress it enough—that the society has passed on that, the society is fair, and that strengthens the case. Those are very important features that it seems to me should not be overlooked.

The insurance company of course is in this business for the money that is to be gotten out of it. I think your insurance men will be frank enough to tell you that. They are not in the business to work for the profession. If the insurance committee compromises it is a stain against the reputation of the man whom they represent in the compromise and it is an invitation for other suits. Yet you cannot blame a money-making insurance company if when it finds it cheaper to compromise than to defend, it compromises. That's to the interest of the company. On the other hand, if by some arrangement of group insurance or by some arrangement of defending your own members you can retain in the hands of your medical defense committee the right to say when a case shall be compromised and when it shall be fought, you have retained in the hands of that committee the right to protect the reputation of the profession as well as the pockets of the individual. It seems to me clear that there is a very active function and duty for a medical defense committee in connection with any state organization.

The group insurance plan has one advantage in that it does get you a cheaper rate. Of course it is said that by group insurance the society becomes the agent of the insurance company. It is because the society becomes the agent of the insurance company that the insurance company can afford to give you the cheaper rate. The company is put to no expense by reason of the collection of the annual premiums, and there is drawn into the group probably a wider range of men than would come in under ordinary circumstances.

That group insurance is successful, that it hasn't operated to the detriment of the men who have gone into it, is shown by the fact that the companies are still writing it. Of course one company claims that it is objectionable be-

cause when a case goes into court the evidence of a man who is in a group will be discounted by the jury by reason of the fact that he is in the group. Well now, the best answer to that is that the companies that are writing group insurance have themselves had a pretty extensive experience and if they found that it didn't work out they would hardly have continued in it.

I believe that there is a very important function for a medical defense committee to fulfill in connection with the state society in the prevention of suits. They can do that best by advising compromises where compromises are necessary, by pushing to the limit every other case, by studying causes of suits and doing what they can in a moral and in a medical ethical way to prevent them. If there are any questions I can answer I shall be glad to try.

THE CHAIRMAN: Dr. Johnson came in contact with a good deal of this in his work. Have you anything to say on this?

DR. H. M. JOHNSON: I discovered this: that so many of the members of the legislature and especially attorneys and especially those attorneys who didn't like us very well anyway—of which we have a number up there—said they knew all about our state insurance. They said that we were banded together, the worst trust in the state; that we stood by one another right or wrong; that we didn't care for money or anything else; that we shouldn't have legislation, a gang of men like that; that we were just so narrow-minded that we would help anybody out, whether he should be helped out or not. I finally explained to them that while we had the state insurance in a way, very few men depended much upon it; and that I understood there was a committee to which questionable cases were referred, when the attorneys thought probably it wasn't a case that should be defended. And if that committee decided that the case should not be defended, then it was settled. Well, that kind of helped out some, but from my experience with the legislature I don't believe that the society should carry state insurance.

Another point that was made here by one of the doctors, and that I believe hurts us and has probably hurt us in the past, is this: Sometimes we may have tried to help out a man that was actually guilty. We have gone to the extreme. We have gone so far sometimes and it showed so plainly that it is pretty hard to convince people that we are not sticking together pretty tight. I believe that we should be fair and square. If a man is unfortunate and does something that is wrong, help him out, settle it as reasonably as possible, but don't stand for what is wrong.

DR. F. J. SAVAGE (St. Paul): Dr. Johnson didn't say one thing that he told me some time ago. I was asking him why there weren't more members from the country in the state association, and he used a little choice English which I won't repeat but the main idea was that the state association didn't do anything for the members. Now on the assumption that there might be two hundred men in the state association who would be left high and dry if this Class B were stricken out, not that there is any legal obligation on our part to continue this defense—but even if it does cost the state association a little money—we have twelve to fifteen thousand dollars in bonds as I understand

it, and if that will create a good feeling among those men isn't it worth while to spend a little money and adopt Dr. Judd's report intact as it reads? That gives those men protection for the next two years and two months approximately, giving them in that interval the opportunity of providing themselves with other insurance if they wish to. I would be very sorry to see Class B stricken out.

THE CHAIRMAN: Now we are getting into complications. I don't understand that this particular clause takes care of all the members in the past. This creates a new group.

A DELEGATE: I would just like to ask in connection with this Group B of five dollars, who assumes that risk? Does the state association carry that or does the insurance company?

DR. JUDD: The insurance company has nothing to do with that. That is the state.

A DELEGATE: Supposing that only about a hundred men sign up for that five dollar rate and then we have two or three cases to defend, where is the money coming from to defend them?

THE CHAIRMAN: Dr. Plondke's point was that all of us have been paying dues up to this time, and he wants us to take care of everybody for two years or our period of liability. This group B doesn't cover that at all, Dr. Savage. This is a new group that will pay five dollars a year and go on indefinitely. That may be only ten per cent of the members, but it doesn't take care of the present members. Dr. Plondke's point is a good one. We have all paid in two dollars a year for protection, and he doesn't feel that we should cut this right off short.

THE CHAIRMAN: We have the amendment to the original motion still before us: That we do away with this group B.

DR. HARE: I rise to support the amendment. For a good many years I have been watching rather closely and from an official position this medical defense feature of the state association. Years ago the funds paid in by the members were ample to take care of all suits which were entered. As the years have gone by there has been a gradual increase in the amount of money expended by the state in defense of its members. This amount of money has been rapidly increasing in the last three or four years; and already, as the secretary has reported, in seven months we are within a few dollars of the full amount expended last year, something over \$3,700 having been paid; \$2,200 in a single case this year. There isn't any question I think in the mind of any member of this association, or in the mind of anyone who has looked into this matter, but that these costs are going to increase as the years go by rather than decrease, unless possibly the law which has just been enacted will diminish the number of suits. However, the proportional cost is going to increase. Inasmuch as this question of discontinuing the medical defense plan of the state association has been in the air for a number of years, it seems to me that this is the time for us to eliminate it. Each individual certainly should have enough interest in his own welfare to protect himself; and if he hasn't, any man of sufficient intelligence to practice medicine and surgery should not expect his neighbors in the profession to be more interested in his own welfare than he himself, and thereby expect them to protect him. I do feel, however, that our legal obligation continues through the period of

the statute of limitations. I think nobody ought to question that, but I am heartily in favor of this amendment which strikes out section two of the committee's report.

DR. WORKMAN: I am going to take just the opposite side. I believe that we should keep in section B for a great many reasons. Nobody will care what it is going to cost. That has never been paid any attention to before. Referring to this case that Dr. Hare cited that cost so much money, had that been referred to the Council and investigated and settled before it came to trial there wouldn't have been any such costs. I think we had better keep that section B.

DR. O. E. LOCKEN (Crookston): I just want to bring a message from the Red River Valley Medical Society, which is strictly a society made up of what we call rural physicians, in support of Dr. Braasch's opinion. We voted in our last meeting that it was the opinion of that organization of fifty-two members that we go on record as against any form of insurance in which the state medical society is obligated to pay. It comes down to this: It isn't a question of whether we have moral responsibility. If we are going to have two or three hundred men paying this and we are not going to have the money to pay it, it is better to cut it out now. That was the attitude of the Red River Valley Society.

THE CHAIRMAN: Now the attitude of the Park Region Society. I see our delegate isn't here. I would like to call on Dr. Estrem up there.

DR. C. O. ESTREM (Fergus Falls): The attitude of the Park Region Medical Society has always been that the state society should not be in the insurance business. I think to a man our society is against this insurance.

DR. H. W. CHRISTIANSON (Wykoff): May we have section B reread?

THE SECRETARY: (Reads Section B.) It is the same old insurance we have always had, with the exception that it is elective and the cost is five dollars.

A DELEGATE: There is one thing that has not been brought out in this. The Hennepin County Medical Society has been very much astonished in the past five years. There are very few men in our society that realize that this insurance does not take care of verdicts. I believe if we struck out that section B it would bring the thing right to a showdown, so that really they would be better off in the end. Many a man has come up for information and been very much amazed to find that all he had was the defense. I think if it is put in or if it is not put in, it ought to be brought to every man's attention; otherwise he comes to a suit thinking that he is fully protected by the state society and he is not.

THE CHAIRMAN: Now unless there is something very important, possibly we had better have a vote.

VOICES: Question.

Standing vote taken; amendment to strike out Section 2 constituting Class B carried by very large majority.

Motion to adopt report with recommendations therein carried.

DR. WORKMAN: I would like to make this one suggestion: That the Committee on Credentials has not yet reported, and any action on any matter that this house has

taken would have to be corrected after that committee reports.

THE CHAIRMAN: I will call on the Credentials Committee right now so we will be sure this is right. Dr. Hunt.

DR. HUNT: The official list of delegates to the House of Delegates of the State Medical Association numbers sixty. There were forty-five present at the last count. Thirteen societies are not represented.

One question came before the Credentials Committee and that was regarding the delegates from the Red River Valley Medical Association. We have disposed of it; however, we bring it up for consideration before the House of Delegates. The question which has arisen there probably will arise again. The report which was read this afternoon stated that the Red River Valley Medical Society consists of 52 members, which entitled them to two delegates. However, there has been some correspondence between Dr. Oppegard and the secretary of the State Medical Association regarding the eligibility as active members of two men who formerly resided in that district and about one year and a half ago moved to New Mexico. They have retained their membership in the Red River Valley Medical Society by virtue of having paid their dues. They are not members of local medical societies in New Mexico. It was understood that the 52 reported included these two men. However, Dr. Locken, one of the delegates from that society, states that the secretary told him yesterday that the society has 52 members without counting these two, which entitles them to two delegates.

The correspondence that has taken place, however, between the secretary of that society and the secretary of the State Medical Association brings for consideration certainly the question of what constitutes membership in a county medical society, on which the number of delegates is determined. That is, if a man has moved away from his local medical society to another county or to another state and retains his membership in that county by payment of dues and so on, how long does he remain in that county medical society as an active member, and for how long a time may his membership be considered active to the extent of being counted in determining the number of delegates? This has occurred before; what disposal was made of it I don't know. It probably will occur again. It seemed to the Credentials Committee that the House of Delegates should make some sort of arrangement on this point. The committee have presumed to suggest a ruling, and present for your consideration the following:

"That a physician who has changed his residence from the county in which he has been an active member in good standing in the county medical society ceases to be an active member and is not included in the roll determining the number of delegates from the society to the State Medical Association after one year."

A DELEGATE: Move its adoption.

THE CHAIRMAN: This recommendation is an amendment to the By-Laws. You have heard the recommendation and it will lay over one day and be brought up tomorrow.

DR. BRAASCH: Will you kindly read that recommendation once more?

DR. HUNT: (Rereads.) I might make a suggestion. Inasmuch as this brings in consideration an amendment to

the By-Laws it ought to have pretty careful consideration first, for there may be some things entering into it that the committee did not take into consideration.

THE CHAIRMAN: This recommendation or amendment will pass over. Otherwise any corrections to the Credentials Committee's report?

Motion to accept report carried.

DR. HARE: I now move that the House of Delegates ratify all of its actions which occurred before the acceptance of the report of the Committee on Credentials.

Seconded and carried.

A DELEGATE: I will make a motion that we refer to the Finance Committee the consideration as to whether we should provide further protection for the period of limitation as suggested by Dr. Plondke.

Seconded and carried.

Report of Necrologist, Dr. Olga S. Hansen:

Since the last meeting of this organization, many names have been added to the honor roll of those dying out of our profession. Many faces of loved and honored friends will be missing at our annual meeting this year. It casts a sadness upon us to realize that our president of a year ago, Dr. Archibald MacLaren, of St. Paul, was on his deathbed at the time of our last meeting in October and died a few days later. An eulogy upon him or any of the other members who have left our ranks would be redundant. They have been friends to humanity and have left the world a happier and a more beautiful place for their having lived in it.

Members who have passed away since our last meeting are:

MacLaren, Archibald...	St. Paul	October 12, 1924
President, 1924		
Monahan, J. A.....	Minneapolis	October 12, 1924
Beckley, Frederick L....	St. Paul	October 23, 1924
Balcom, George G.....	Lake Wilson	November 6, 1924
Graves, Carlton.....	Aitkin	November 20, 1924
Williams, John.....	Lake Crystal	November 21, 1924
Pratt, Chelsea C.....	Mankato	December 20, 1924
Thomas, David Owen...	Minneapolis	February 11, 1925
Lee, John W.....	Minneapolis	March 11, 1925

The following names have been reported in the medical journals:

Riches, Charles W.....	Minneapolis	November 12, 1924
Mann, Eugene L.....	St. Paul	March 14, 1925

Respectfully submitted,

OLGA S. HANSEN,
Necrologist.
April 28th, 1925.

Dr. Workman presented recommendation of Council that the House of Delegates authorize it to redistrict the state; approved.

DR. WORKMAN: We also recommend—this would help out Dr. Johnson's idea a little—that there should be a society in every county that has at least six physicians. Now it isn't the idea that that would interfere with any of the district societies, but if there were a local society that could meet with the district society it would put us in close touch with the profession in every county. That

is only a recommendation for you men to take home. It would be the best thing for this society. Every society would be entitled to a delegate in this house, and it would bring in many more men that could get in touch with members of the profession throughout the state. I think that it would be a mighty good thing.

The Council asks that it be authorized to have the Constitution and By-Laws corrected up to date and some copies printed. We have only about two or three copies now. I would move that the Council be authorized to have those printed.

Seconded and carried.

At the suggestion of Dr. Workman, the Council was authorized to have printed copies of the early proceedings of the association. Dr. Geo. Earl suggested that a copy be placed with the State Historical Society.

THE SECRETARY: The following amendment to the Constitution, proposed by Dr. H. M. Workman last year, was laid over to the present meeting. It is article 5, the paragraph as to who shall constitute the House of Delegates, and adds the words: "Also the chairmen of the various appointed committees and the delegates to the A. M. A., but without a vote."

Moved and carried that the amendment be adopted.

DR. ADAIR: "That in addition to the per capita dues of \$5.00 that during the years 1925, '26 and '27 each member be assessed the sum of \$5.00 per year for the creation of a fund to be known as the Public Health and Legislative Fund.

"That this fund may be used at the discretion of the Council for maintaining a representative of the medical profession in St. Paul during the session of the legislature and for such publicity and public health educational work as the Council may determine.

"That in 1928 and thereafter this assessment may be reduced by the House of Delegates, but such fund shall amount to a minimum of \$10,000 by January 1st of the odd numbered years."

This is an amendment to chapter IX, Section 15 of the By-Laws, to be inserted after the last word in that section. I submit this, gentlemen, to be referred to the Finance Committee to have something to work on.

DR. PLONDKE: I move that this be adopted.

DR. J. T. CHRISTISON: I would like to second it, and I want to say why. If we are going to—as I presume we are—interest ourselves in medical legislation, it is going to be absolutely necessary that we have funds to do it with. If this one law that we have changed during the past session of the legislature means anything, it certainly is worth at least five dollars a year to every member of this state society. If you stop for a moment to consider the difference between a malpractice suit that must be brought within two years of the alleged malpractice as against one that may be brought six years afterwards, you can realize what the saving may mean, not to this House of Delegates but to every member of the state society. I feel that if we are going to interest ourselves, and the society insists that somebody shall interest themselves in legislation, you have got to give us money to do it with.

THE CHAIRMAN: You have heard this recommendation to be referred to the Council, that our dues be increased five dollars a year chiefly to be used for legislative purposes.

DR. PLONDKE: Mr. President, you said the dues; this is an assessment. Dr. Savage drew this up and it was his suggestion. The reason we made it an assessment was so as to make it more elastic. The delegates can discontinue this in two or three years if you have sufficient funds. That's the reason for making it an assessment rather than an increase of dues.

THE CHAIRMAN: I stand corrected.

DR. SAVAGE: I would like to say that this amendment to the Constitution, which provides a five dollar assessment for a period of three years and then to be reduced at the discretion of the Council, would be an optional measure to be considered along with Dr. Johnson's recommendations which have already been referred to the Finance Committee. It would be entirely unnecessary to adopt both. This has a little different wording, and the idea is to have a fund which may be reduced at a later period but which on the odd numbered years when the legislature meets may contain a sum of ten thousand dollars as a working capital for legislative purposes.

DR. DRAKE: Dr. Johnson's recommendation which the House of Delegates is referring to the Council is that the dues shall be increased sufficiently so we will have funds to carry on this legislative work. Now if the House of Delegates goes further and recommends that we should raise this fund, that means five dollars more, and the Council is very likely to act on the opinion of the House of Delegates. If the dues are raised (which is going to be necessary to meet the deficit) to eight dollars, and then if we tack on another five dollars that is going to mean considerable dues. Five dollars from each member is going to be ten thousand dollars this next year and ten thousand dollars the next year, and make twenty thousand dollars for the next session. Why not pay as we go? If the Council thinks that we ought to spend five to ten thousand dollars on legislative work I am in favor of that, but I can't quite see the point of establishing a large fund to draw on if necessary. If we had a large fund we would probably spend it. I think this would mean that a lot of members would drop out. A lot of members will stay here in the society at eight dollars who won't stay at thirteen. As far as I can see that's about what will happen. I think it is very important to keep up the membership of the association.

DR. BRAASCH: I heartily endorse the sentiments just now expressed because we have so many things to raise money for, not only the deficit but the full time secretary and a number of other things. So I think we certainly ought to curtail this assessment. Now I would prefer this, if I may offer a suggestion, that we levy an assessment for this year to cover not alone the raising of a fund for legislative purposes but also our deficit, and if next year we think the money is wisely spent we can make it an additional assessment or make it a regular dues. According to the Constitution this House of Delegates is empowered only to make an assessment, and that only by a four-fifths vote. Therefore I would amend: That the five dollar assessment

be expended by the Council as they see fit for the various purposes suggested.

DR. ADAIR: I move that this be referred to the Finance Committee of the Council without recommendation.

DR. WRIGHT: I think we ought to make some definite recommendation because it will help the Council, but I am opposed to recommending any definite sum. I would rather see this thing worded, say that we recommend raising the dues by assessment or by assessment raising sufficient funds to do these things that we want to do, and leave it to their discretion as to how much we will raise and how we will raise it. I don't think it is wise to instruct them definitely either as to the means or the amount, nor do I think that we should let it go without giving them some instructions as to our ideas for raising this fund.

DR. W. A. JONES (Minneapolis): Ramsey County is worth about a hundred thousand dollars, has that sum collected and in the savings bank. Why should not the State Medical Society have a large sum at its disposal as well? Why shouldn't we not only reimburse Dr. Johnson for his personal expenses this last year but be ready also to meet our obligations by making the assessment sufficient to cover the whole situation?

DR. DRAKE: If we are going to have our dues increased for 1926 we have got to take action on a recommendation today so that it can be voted on tomorrow, otherwise it will have to lie over until October, 1926, according to our Constitution. It seems to me that this House of Delegates ought to make a recommendation as to the amount of dues for 1926 so that they can be raised, because it is going to be necessary. Instead of just making recommendations to the Council we ought to specify the amount. We can say "at the discretion of the Council," say five dollars more, and have the dues for 1926 ten dollars, if that's the wish of the members here. Then we can have the dues raised in 1926.

DR. ADAIR: The only reason I made the motion as I did is that it seems to me there are a number of financial items to consider in connection with this, and the House of Delegates isn't at present informed as to what would be the wisest expenditure of money or just how much money is going to be necessary to cover the things that we need to do in 1926. I think after the Council has these various questions analyzed they will be in a position to advise us as to how much we need to increase our dues during this period of time. That's the reason I made the motion to refer it without recommendation.

DR. BRAASCH: It strikes me we ought to go slowly. With the present trend of economy in the air we can't raise the dues to ten dollars too. The legislature is not going to meet next year so we won't need so much for that, but I think we have a five thousand dollar deficit to take care of and that's going to need a large assessment to begin with. It strikes me that a five dollar assessment would be a great plenty. In other words, if the state dues are ten dollars that alone is going to be a formidable amount for many a country man to pay. Of this five dollar assessment some money can be put into the legislative business but we have got to use a good part of it for the deficit.

Motion to refer the matter to the Finance Committee of the Council without recommendation carried.

DR. CHRISTISON: I desire to make a motion that Dr. H. M. Johnson be reimbursed for the amount of money that he has actually spent during this session of the legislature. The idea of reimbursing him for his time and the loss of the money that would accrue from his practice is entirely foreign to my idea. I do think, however, that this society ought to reimburse him for the actual cash that he has expended, and I happen to know that that is just about two thousand dollars.

DR. SAVAGE: I would like to second that motion, and by way of adding some remarks I would like to give a little history. Four years ago the Medical Defense Company of Fort Wayne rather backed this bill that has gone through this year. That bill was defeated. Two years ago I was chairman of that committee and they also wanted that bill put through that year. They wanted us to try it but it was decided not to attempt it. I took it upon myself early in January to write the Fort Wayne people, entirely unofficially, to ask them whether or not they would be disposed to pay part of Dr. Johnson's expenses, and they were non-committal in their answer. It is a business proposition with them. Dr. Johnson has told you that they consider withdrawing from the state. They are the only concern that hasn't gone up in their rates. Last week I wrote them again and said, "We aren't asking you for this money but we would like to know whether or not you would like to pay something of Dr. Johnson's expenses." I didn't get their final word until this morning. They make an offer through their chief attorney, Mr. McLucas, if the state association wishes to accept it, of paying to the state association one thousand dollars of this two thousand dollars which Dr. Johnson has spent.

Motion to reimburse Dr. Johnson carried.

A DELEGATE: I move that we accept the Fort Wayne proposition with thanks.

A DELEGATE: May I just rise to a point of information? I understand that St. Louis County has a blanket policy I believe with the Aetna Company. Are we in accepting this thousand dollars from the Medical Protective Company of Fort Wayne entering into a moral obligation to give them a blanket policy of the state society?

THE CHAIRMAN: They won't take it.

Motion to accept Medical Protective Company's offer with thanks seconded and carried.

DR. DRAKE:

Mr. President and Members of the House of Delegates
Minnesota State Medical Association:

The World War Veterans Act, 1924 (Public, No. 242, 68th Congress), passed by the Federal legislature at Washington, provided for a revision of laws applying to the Veterans Bureau, War Risk Insurance Act and the Vocational Rehabilitation Act and provided for an independent bureau to be known as the United States Veterans Bureau, the director to be appointed by the president of the United States with the consent of the Senate and to be directly responsible to him.

The act provides in the main for medical care, compensation and rehabilitation of individuals who served their country in the World War.

In addition to such provisions, however, appears in this Act, under Title 2, Section 202, Subdivision (10), the following:

"(10) That all hospital facilities under the control and jurisdiction of the bureau shall be available for every honorably discharged veteran of the Spanish-American War, the Philippine Insurrection, the Boxer Rebellion or the World War suffering from neuropsychiatric or tubercular ailments and diseases, paralysis agitans, encephalitis lethargica or amebic dysentery, or the loss of sight of both eyes, regardless whether such ailments or diseases are due to military service or otherwise, including traveling expenses as granted to those receiving compensation and hospitalization under this act. The director is further authorized, so far as he shall find that existing government facilities permit, to furnish hospitalization and necessary traveling expenses to veterans of any war, military occupation, or military expedition since 1897, not dishonorably discharged, without regard to the nature of the origin of their disabilities; Provided, That preference to admission to any government hospital for hospitalization under the provisions of this subdivision shall be given to those veterans who are financially unable to pay for hospitalization and their necessary traveling expenses."

Also Title 2, Section 203, reads in part as follows:

"Section 203. That every person applying for or in receipt of compensation for disability under the provisions of this title and every person applying for treatment under the provisions of subdivisions (9) or (10) of Section 202 hereof, shall, as frequently and at such times and places as may be reasonably required, submit himself to examination by a medical officer of the United States or by a duly qualified physician designated or approved by the director. . . . For all examinations he shall, in the discretion of the director, be paid his reasonable traveling and other expenses and also loss of wages incurred in order to submit to such examination . . ."

The two sections above quoted clearly provide for hospitalization, traveling and other necessary expenses and also for compensation for loss of wages incurred by hospitalization of veterans (army and navy) of any war or military occupation since 1897. This medical service is free to veterans irrespective of whether the disease or disability is associated or due to service and irrespective of financial status of the individual. The only restriction placed on such service is that those unable to pay for private medical attendance are to be accommodated first by the bureau facilities. This amounts to provision for free medical service to several millions of individuals who have been in the army and navy since 1897.

The medical profession heartily endorses the provisions made by the government to treat and rehabilitate veterans suffering disability due to government service. The profession is opposed to the policy and practice provided in this act of furnishing free medical service to veterans for ailments in no way associated with governmental service. The provision socializes medical services to several million citizens of our country.

The following resolution is therefore submitted:

"Resolved:

"That the Minnesota State Medical Association hereby express through its House of Delegates its disapproval of the principle and provision made under Title 2, Section 202, subdivision 10 of the World War Veterans Act, 1924,

for free hospitalization of veterans for disabilities not the result of service;

"That the Legislative Committee of the Minnesota State Medical Association be authorized to take such steps as may seem feasible to correct this provision now in effect;

"That the Minnesota delegates be instructed to bring this matter to the attention of the House of Delegates of the American Medical Association at their meeting in May, 1925, with a view to having them define the position of the American Medical Association on this matter."

C. B. DRAKE.

A MEMBER: This is a bill which affects all the boys who wore the uniform in the war up to the time it was passed. I happen to be one of those who helped pass that bill, not directly—I was not in Washington like my good friend Johnson was on the ground—but I did help in an indirect way. I spent a good deal of time and even spent a few pennies (didn't have much to put in), and we thought at the time it was a just bill and we still think so. The bill was passed after a great deal of work out there. We think that it is covering ground that could not be covered otherwise. It may be defective in some ways but it takes care of a whole lot of boys who cannot trace their disability to the service but at the same time their disability is due to the service, where you can't get any proof of such condition. Now to state that this bill is making it a socialist affair, I don't know what my good friend Drake means by that. I don't believe in state medicine, but when those boys went over and put the uniform on you came very near doing a socialist affair. You didn't ask them where they come from, what they have in their mind, what color their skin is, what they believe. You were very glad to have them shoulder a rifle and go and fight for you. Now why, when the law comes in and takes care of a large percentage of them who may not be taken care of otherwise, why should we try to repeal that law? It seems to me that the medical profession should be the first ones to back this law and keep it on the statute books of this country. I do hope that this recommendation will not be adopted.

THE CHAIRMAN: Does this law provide that these men be taken care of as long as they live?

MEMBER: As long as they need it. If a man has been in the service and he has got to the point where he can't prove that his disability is due to service the law didn't take care of him, but this law now does take care of him. It is very true that there may be some abuse, it opens the door for some kinds of abuse, but I would like to have you point me a law in this country which hasn't got a good many trapholes for abuse.

THE CHAIRMAN: It actually provides then to take care of these men as long as they live, whatever happens.

MEMBER: Why certainly. The law provides that if they need it they can be in a government hospital and cared for. I say to you that they are entitled to it.

Motion to adopt Dr. Drake's recommendation seconded and carried.

THE CHAIRMAN: I would like to thank the House of Delegates for your courteous action and expeditious work.

Moved and carried that the House of Delegates meet in the Men's Union Tuesday at 12:30.

Adjournment, 5:20 p. m.

SECOND MEETING OF HOUSE OF DELEGATES

APRIL 28th, 1925

The House of Delegates held its second meeting Tuesday noon at 12:30 in the Minnesota Union. President Burnap presided.

THE CHAIRMAN: Dr. Aldrich is the only member of the medical profession in the legislature so we invited him over here to give us a few words on this legislative matter.

DR. F. H. ALDRICH (Belview): Mr. President and Gentlemen of the House of Delegates: As the chairman said, I am the only physician in the House of Representatives and the Senate, and you can see at a glance, as they say in the old way, by looking at the program about how badly you were represented over there in the state legislature this year. I had the good fortune to have a couple of fellow members over there who were doctors, but not M.D.'s; they were dentists. One of them was Dr. Colp, formerly mayor of Duluth. He was chairman of the Public Health and Hospital Committee. The other was Dr. Wilson from Belle Plaine. I must say that they gave real good co-operation in everything. We helped out on the dental bills and they also helped me out on any bills that I thought were needed.

Now I must say, gentlemen, it is really a sort of sad commentary on the medical association of this state, that I am the only medical representative. There should be at least half a dozen doctors over there in that legislature, absolutely. It is a hard job for one man to do much of anything. Of course you all say immediately that you are too busy, you can't afford to do that, it is a losing proposition, you can't afford to take the time. But it's the same way with me. You don't hardly get by with the salary you get down there. You come back without anything if you're any kind of a spender at all. I know there are a great many men in the Minnesota Medical Association who are wealthy, and I think it would be a fine thing, instead of taking their annual vacation and going down to Florida say for three months and eating grapefruit and swimming around a little, or instead of thinking about going to California for the winter, if they would just take about three or four months to run for the legislature—not only run but land.

It's some little job to do it, especially for a medical man. The first thing you are met with, especially out in the country, and I am a country doctor—of course I don't know as I ought to apologize so much for that because the Mayo boys say they are country doctors, so maybe it is a compliment instead of otherwise—but as soon as you file for an office of that kind, representative or senator, they say, "Well, that's a doctor." They regard him with suspicion immediately. They say, "What does he want to do? He wants to go down there to reward doctors for an operation of appendicitis, and all that sort of thing." If not, they said, "Well, we're farmers out here; what does a doctor know about farming?" I used to tell them in the first place it wasn't so, and I didn't think so much of the last part because I don't believe there is anybody outside of a farmer that knows any more about the conditions in the farm home than the doctor himself; so I don't believe that argument holds good.

I really don't see any reason, as I say, why at least half a dozen medical men in the state of Minnesota shouldn't be members of the House or Senate over there at St. Paul. Organization is what counts. One man is quite helpless in a place of that kind. The dentists are well organized over there; they are well represented. They look after everything; they don't let a thing slide by that is in their interest at all. As far as the legislature is concerned the lawyers are well organized, much better organized than the medical men are. There are a good many lawyers in the House and Senate and they get on the Judiciary Committee; and if you have any bill that they don't fall in line with, you are going to have some job to get that bill passed in the Judiciary Committee.

Take the bankers now, they have it on us four ways for Sunday for organization. Whenever the bankers want anything they have their country organizations get together and talk it over and have a nice little feed and a good smoke, and they come down to the capital there with a bunch of fellows. They spend their money pretty freely. This winter they wanted to get their personal property assessment on banks reduced from 40 per cent to 33⅓ per cent. Well, of course that seems kind of peculiar to start with. Immediately a bank wants anything, it is a good deal the same as when a medical man wants something, everybody thinks he shouldn't have it. But they came down there and through an almost perfect lobby they had that banking bill passed and did reduce their personal property taxes. They went home then feeling pretty satisfied, and of course they should have been.

A little while later one of the members over there introduced a bank guaranty bill. You know they say if there is anything that gets a banker's goat it is to think about a bank guaranty bill. (Some of you men may be bankers as well as doctors.) They had several meetings, got together, got their crowd down there again, and started in with their nice little lobby. They spent considerable money. It takes lots of money to do things. They had several banquets, invited the boys out, gave them a good smoke and a good feed, and when they went home that night they decided the bank guaranty bill was no good. The upshot of it was that the bank guaranty bill died in the committee.

The chiropractors were over there wanting some of their bills passed. They are well organized; they spend money freely. They come over there nights that they have a public hearing. They do allow a public hearing on almost anything when there is any demand for it. They pack the House gallery and the floor with their friends, and when one of their people gets up to speak—some of them are pretty good spielers—and makes a point, or they think he did, those friends of the chiropractors raise the housetop with their applause. But for instance in the antivivisection bill a man gets up to talk he has only half a dozen friends in the house. Whenever one of those bills comes up it would be a good thing if every friend of the medical profession would crowd the gallery and applaud just as hard as those fakes do for their friends. Dr. Johnson made a good talk on the antivaccination, and part of the time they were against it, and those who were against the vaccination would even hoot, give a catcall once in a while.

When he got finished, four or five fellows applauded. But when the chiropractors got done, why as I say, they almost raised the roof off the house with their applause. They are organized and they spend money.

Now in the Legislative Committee, gentlemen, you have been very fortunate this year. There was a middle-aged doctor came from out of the west, Dawson, where some big men come from. You know Theodore Christianson comes from Dawson. I suppose we will have to hand him the palm for being the biggest man. Dr. Johnson may not be as big a man as Christianson, but he is a pretty good sized man. Dr. Johnson deserves much credit. He is one of the best men I believe that could possibly have been chosen to fill that position. When he came down there to the legislature a few of the boys that I happen to know said, "Who the dickens is this Dr. Johnson?" They seemed to resent his presence there. They said he was lobbying for bills. Well, it wasn't very long before they began to find out who this Dr. Johnson was.

I think it is a good plan to have somebody down there. He must be a medical man of course, and must be on the job all the time. I don't know whether Dr. Johnson would go back or whether you would want him to go back, but I don't believe you could get a better man. I thank you, gentlemen, for the opportunity of saying a few words.

Dr. Adams reported for the Credentials Committee: 49 delegates registered, representing 26 societies.

Minutes of previous meeting of the House of Delegates were accepted as read by the secretary.

Dr. Workman read the minutes of the second meeting of the Council.

DR. WORKMAN: The Council recommends as follows: "That the dues remain the same for the next two years as they have been in the past, and for this two dollars the Association will take care of all retroactive cases of members in good standing. We feel that we are morally obligated for the protection of members in all cases coming under the Medical Defense Act from a period from June 27, 1923, to June 27, 1925, from which time the new statute of limitations is effective."

Moved and carried that the recommendation be adopted.

DR. WORKMAN: "The Council recommends in the case of the recommendations in Dr. Johnson's report and the amendment submitted by Dr. Plondke that a special assessment of five dollars be levied against each member for the establishment of a fund for educational purposes to be expended by the Council."

DR. PLONDKE: You said "for educational purposes." There is a question as to whether that would cover the ground.

DR. WORKMAN: I think it will cover all ground because legislation is educational work, radio is an educational proposition, and everything of that kind. It doesn't leave the impression outside that we have a graft fund.

DR. PLONDKE: I move that be adopted.

Seconded.

THE SECRETARY: Shouldn't we amend that by adding that this assessment shall be in force for a number of years in case some may drop out and then come in again?

THE CHAIRMAN: You have heard this provision that all future members pay this assessment.

A DELEGATE: Dr. Aldrich just told me that the chiropractors are assessed about twenty dollars apiece, and if they are good for that we certainly ought to be good for five.

Motion carried.

DR. WORKMAN: The Council recommends that Article XI of the constitution, Funds and Expenses, be amended to read: "Funds shall be raised by an equal per capita assessment on each component society. The amount of the assessment shall be fixed by the House of Delegates, but shall not exceed the sum of eight or ten dollars per capita per annum, except on a four-fifths vote of the delegates present. Etc."

Moved and carried that the recommendation be accepted.

DR. WORKMAN: "The Council recommends to the Committee on Hospitals and Medical Education that the \$100 necessary for graduate education be raised by assessments on members who benefit thereby."

Moved and carried.

DR. WORKMAN: The Council recommends "that the motion relating to the amendment submitted by the Credentials Committee be laid on the table as the situation at present does not demand a remedy."

Carried.

DR. WORKMAN: The Council recommends that chapter 11, Medical Defense, be amended to read: "Section 1. The Council shall be authorized to make a contract with an insurance company for group insurance for the Minnesota State Medical Association for malpractice suits. Each member shall pay for the policy he selects. Section 2. Members not subscribing to the group insurance plan must defend themselves entirely at their own expense."

DR. PLONDKE: In connection with this—I think it has been omitted—the members ought to be notified at once that the insurance of the state society has been discontinued, had they not?

THE CHAIRMAN: You have heard this suggestion; that would be a suggestion.

Recommendation accepted.

DR. PLONDKE: I move that the secretary be instructed to write every member of the State Medical Association that the state insurance will terminate June 27th, and also explain to each member that he is taken care of for two years as far as the insurance goes for any cases that might arise from the last two years as stated in Dr. Workman's Council report.

Carried.

THE CHAIRMAN: Any amendments or anything that should be offered now?

DR. PLONDKE: I would like to make a recommendation but I probably am saying too much. I think that this House of Delegates ought to take some action to back up or rather give the component societies something to work on in the matter we suggested yesterday in the House of Delegates and also stressed last night, about entering into politics. I took this matter up before the Ramsey County Medical Society at the last meeting and asked them if the question should arise at the state meeting what they thought we should say. They voted that the state society and all component societies should enter actively into politics on matters pertaining to medicine, directly or indirectly. The question will arise with the members of the smaller so-

cieties, county societies, that we are not a political institution, we have no right to do it; and I think that we ought to take some action here instructing them—not necessarily instructing them but giving them permission to do what they can to elect a candidate that would be in our favor, or anything along that line.

THE CHAIRMAN: Is that a motion?

DR. PLONDKE: No, I simply suggested it. I didn't want to go as far as a motion, but I think we ought to make a motion to that effect.

DR. W. A. JONES: I should like to make it a motion, that the entire organization get into politics and get into it fast. We need it. We have been foolish about it and delayed here for a year. I am not over-enthusiastic about getting into politics but I firmly believe in getting into all kinds of publicity that is of benefit to the medical profession and the public.

THE CHAIRMAN: Of course Dr. Naegeli was with us from the dental committee and asked that we unite with them, that our committee be empowered to work with theirs. You have heard this motion that the House of Delegates is in favor of every doctor interesting himself in a political way, and that we empower our Legislative Committee to form alliances or an understanding with our dental friends. I would like to say here that the publicity proposition was very close to my heart, and one disappointment I had is that we didn't succeed in arranging an address before the Kiwanis and Rotarian and all those clubs. I will say what I said before: Dr. Rowntree spoke before the Kiwanis Club in Duluth and did more good than anything that the whole organization has done for a number of years. And he is doing it today noon. At our subsequent meetings I think if possible we should try to have our men speak to these luncheon clubs.

DR. BRAASCH: I have been very much interested as to the reaction among the members of the association in regard to the publicity carried on through the radio. Dr. Savage has done an immense lot of good work along that line, and I don't think his energies should go for naught. It deserves the active support of every member of the association. I don't know of any means whereby publicity, as Dr. Burnap speaks of, can be accomplished so cheaply as by the radio. It offers tremendous possibilities. I wondered how many members of the association heard the talks given this winter and how many thought it was worth while. Any suggestions along that line I am sure would be welcome.

DR. CROSS: Was there any announcement made of these radio talks? I heard none of them; I knew nothing about it. All I get is the Christian Science sermons Sunday night when I put it on, and I was a little disgusted.

DR. SAVAGE: That was all published in the newspapers, Dr. Cross, under the radio announcements, several days in advance; very inconspicuous, it is true.

DR. CROSS: It seems to me that it is buried in that mass of stuff. It is in small pica and nobody ever wades through it. I wish Dr. Savage would talk on this; there are several things I would like to know about this radio. What does it cost? Are we opening the doors to the cults and those things? Have we got to play even with our friends on the other side of the fence? What is it going to lead to?

You know the National Association of Advertisers—excuse me for mentioning it; I don't mean to put ourselves in that class, but to bring out this point that one thing leads to another in this radio business—the National Association of Advertisers found that they couldn't permit anything of certain classes because of the fact that it interfered with somebody else and there was trouble. Of course ours wouldn't interfere with anybody at all. It would be just simply education along the lines of what medical science has brought out. I would like to hear again from Dr. Savage if there is time.

THE CHAIRMAN: That will be all right, but is this really discussion or shall we have this motion first? The motion is that we take an interest in politics.

Motion carried.

DR. SAVAGE: Dr. Pearce was a prime mover in getting these radio talks started. He took it up with the management of the radio concern and we met the assistant manager one day at lunch. Our understanding was that these talks were for a certain definite time. There was no expense whatever attached to them. They were to be announced as being under the auspices of the Minnesota State Medical Association and whatever county medical society the member writing the paper held membership in. That program was carried out. We got a little mixed up with Rochester at times in the newspaper announcements, for which we sent our profound apologies to Rochester; but the last one both the newspaper and the radio announcer got it straight.

This was an arrangement for the time being only. I imagine that any further arrangements would have to be arranged for definitely year by year. Major Harrison agreed with Dr. Pearce that no cult would be allowed to talk. I might say that his viewpoint all the way through was exceedingly friendly to the medical society. There was more or less assumption on our part in having these talks announced as under the auspices of the state association but we took the matter up with Dr. Burnap, and those interested in it seemed to offer no objection. It seemed a wise way to announce it, giving the papers rather more standing than if we simply announced the county society. I think any future arrangements would have to be made probably from year to year, but if the same management is still governing among the radio people I can assure you that their attitude is most friendly.

I asked Dr. Braasch to bring this matter up, as to whether or not the state association thinks that these radio talks are worth while. I can assure you that if I didn't believe they were worth while as one of the many factors in creating an intelligent viewpoint in the public. I would be very unwilling to do any work or ask any members to write papers. I think we must not expect very many radical changes in one year but if we can get a little something going year by year, then I believe the effort is worth while.

DR. PLONDKE: No name is announced?

DR. SAVAGE: No name has been announced except where the men writing the papers were either full time teachers or engaged in public health work. The principles governing the radio broadcasting were established last year at a meeting of the House of Delegates, and they have been strictly adhered to.

DR. JONES: I presume the members know that from Davenport somewhere they are broadcasting all the time. They have set evenings for broadcasting chiropractors. There is no way of course to stop that sort of thing. If a man wants to tune in on a broadcasting station from Davenport he can do so, but it does interfere with the medical work. How we are going to overcome that I can't understand.

DR. SAVAGE: Let me add that the newspaper publicity given these talks amounted to about 260,000 newspaper editions. The papers from Rochester and St. Paul were published either in whole or in part by either the St. Paul Pioneer Press or Dispatch and also in the country editions of the Dispatch. As the talks progressed they began to shorten those papers and gave more of a synopsis of them.

I might mention some of the difficulties. The radio people told us these talks were too technical; they also told us they were too long. The newspapers said they were too long. The men who wrote the papers said they were the hardest papers they had ever written because they had to use plain language, the kind of papers that they were not accustomed to writing. But the general co-operation that we had was excellent. No one who was asked to write a paper declined to do it.

THE CHAIRMAN: I think really the question is whether the House of Delegates approve of what has been done and wish to continue it. I would add that the Hennepin County Society had a series of papers. It has not been given yet, has it?

DR. SAVAGE: They are in process of being given now.

DR. WORKMAN: I would like to ask Dr. Savage if it wouldn't be possible to get those papers published in the Minneapolis papers also?

DR. SAVAGE: I think that if this program were undertaken another year by having a little more time to work it up it would be possible to get more newspaper publicity, and I really feel that that is a more important factor than simply the radio talks. That is a thing that the committee should very carefully investigate, to get the widest publicity possible.

DR. WRIGHT: I am very much interested in this because we brought this thing up with Major Harrison for quite a while in Minneapolis, through the executive committee and other places, before we decided to go into it. There isn't any question but what we can get the air, if we can just get enough hot air to put over the air. The difficulty will be, in my opinion, in getting men to consistently and conscientiously keep this thing up after it is once started. I have been called on to write one of those papers myself, and it is the most difficult thing I have ever done in my life. You can ordinarily write a paper in the usual way without much difficulty, but when you try to put in five hundred words something which will interest one who is not interested in the beginning, you've got a proposition on your hands which is difficult.

At one of our meetings we had Adams of the Journal over to discuss the method of writing papers for the press, and he certainly opened our eyes as to how to do it. I think that it might be of value if the societies, like St. Paul and Minneapolis, would have some man who is capable, for instance a man who represents the press, to give them a

little idea in a few talks on how to write these papers. As I say, it is going to depend entirely on how successfully we put those papers over as to how long and how frequently they help us in getting the air. I think that's the real point so far as we are concerned.

DR. BRAASCH: Dr. Savage, would you prefer to have this work carried on in the future as it is, by a committee on public legislation and publicity, or would you prefer a separate committee on radio activity created?

DR. SAVAGE: That raises quite an interesting question, and Dr. Wright has said quite a little in the few words that he said. I think there is a good deal to it. One most extraordinary paper came to us submitted to Major Harrison which was nothing but baby talk, the theory being that you must have these things so simple that a six year old child can understand them, that they must not be too technical. For instance this paper was on care of the teeth and they started out, "This little pig went to market," in a rigamarole like that. The whole point the man made in his paper was that one should wear calf shoes. That's all he had to say in his paper, and he took about five pages to say it. It was the most absolute nonsense. I think the writing of these papers should be specialized work, and there is very much in Dr. Wright's comment. We discovered some time ago that these talks should have as far as they can a human interest to hold the attention of the people as they listen to them and be more than merely scientific discussions. I think that should be done by a special broadcasting committee.

THE SECRETARY: I think every radio fan knows of Dr. Peppard's Toothbrush Club. That covers the subject I suppose that Dr. Savage and Dr. Wright spoke about. The dental societies of Hennepin County and Ramsey County spent about six or seven hundred dollars last year with WCCO. Now this year they intend to spend about seven or eight hundred dollars.

Mr. Chairman, I move you that a committee be appointed to conduct the radio program work and that the committee be instructed to continue developing it.

I would like to say another word in regard to that. Dr. Wright is all right as far as he went but it takes a long time to educate people to write newspaper stories. You have got to hire somebody. I think that if this committee will get together perhaps they can suggest a scheme whereby it wouldn't cost the association the complete salary of a person of that character. If we could find the right one—they are very difficult to find—perhaps we could tie up between the dental and our association.

Motion seconded and carried.

DR. HARE: While you are talking about radio, I was approached yesterday with the statement that the Minneapolis Journal is very much interested to know whether or not the state association is interested in the placing of radios in the hospitals. I believe they have some program in mind relative to continuance of the radio activity at Glen Lake and in some other hospitals, and they would like very much to know whether or not this association is in favor of installation. In order to bring it before the House of Delegates and get an expression of opinion on the matter, I move that it be the sense of the House of Dele-

gates that the installation of radio in the various public hospitals is a good thing.

Seconded and carried.

DR. ADAIR: I have just a little communication here which should have been presented at the meeting last October. I was unable to be there in person but I sent this to the secretary and I don't know whether it was taken up or not. It is in connection with maternal welfare. As perhaps some of you know we have a national committee on maternal welfare representing the American Association of Obstetricians and Gynecologists and Abdominal Surgeons and the American Child Health Association. This committee has been trying to secure the interest and co-operation of the different state and county and district societies in developing programs to improve conditions surrounding maternity from the standpoint of the physician. We have made no point at all of making contacts with lay people but are simply trying to develop interest among medical men in better obstetrical practice.

Now if this organization sees fit to co-operate so far as the state of Minnesota is concerned among its component societies, I think the committee would appreciate it very much. We could appoint either a committee or some individual or co-operate perhaps with the committee on education, any way you see fit. What we are trying to do is to develop in each state leaders to see that this important phase of medical practice is not neglected but is raised to a higher plane than it has occupied in the past. I might say of course that Minnesota is a lot better than many other states, but I don't see any reason why Minnesota should lag on that account.

THE CHAIRMAN: What do you suggest exactly that we do?

DR. ADAIR: Well, if the state society would see fit to either designate some individual or some committee to try and develop particularly on the programs of county societies and of the state society more interest in obstetrics—I don't mean the theoretical side of it or the scientific side but everyday obstetrics—to try and teach their members the best obstetric practice, not to have highbrow papers on these problems, but common everyday practical clinics or papers in the society to improve the care of mothers and the newborn.

It was moved and carried that such a committee of one be appointed.

DR. BRAASCH: At the last session of the Minnesota legislature a law was enacted authorizing the State Board of Control to sterilize feeble-minded and insane persons who by a due process of law are committed to its care, provided, however, that consultation be held first with the superintendent of the custodial institution where the insane or feeble-minded person is kept, and also with a competent physician and psychologist, and that written consent be secured from the nearest of kin or from the legal guardian of the feeble-minded or insane person.

Sixteen states have already legalized sterilization of their socially unfit people who would transmit their mental defects to their offspring. The state of California has sterilized approximately 4,000 such persons.

If the Minnesota State Medical Association at this meeting would congratulate the State Board of Control on the

authority given to it by this new law it would encourage that board to carry it out in proper cases. The following is therefore suggested as suitable to be sent by your body to the State Board of Control:

"The Minnesota State Medical Association in session at the State University congratulates the State Board of Control on the fact that recent legislation has enlarged the scope of your activities, and we hope that the state of Minnesota will soon attain a leading place in the matter of social good accomplished by your application of the new eugenics law."

Moved and carried that the message be sent.

THE CHAIRMAN: Place of meeting next year.

DR. DRAKE: In behalf of the Ramsey County Medical Society I want to extend an invitation to the association to meet in 1926 at St. Paul.

DR. SOCCE: I move you that we accept the invitation with thanks.

Seconded and carried.

The following officers were duly nominated and elected: President, Dr. Herman M. Johnson, Dawson.

First Vice President, Dr. W. F. Braasch, Rochester.

Second Vice President, Dr. Arthur W. Collins, Duluth.

Third Vice President, Dr. E. G. McKeown, Pipestone.

Secretary, Dr. E. A. Meyerding, St. Paul (re-elected).

Treasurer, Dr. Earle R. Hare, Minneapolis (re-elected).

Councilors:

Second District, Dr. J. G. Millsbaugh, Little Falls (re-elected).

Third District, Dr. Frank A. Savage, St. Paul.

Fifth District, Dr. H. M. Workman, Tracy (re-elected).

Delegate to A. M. A., Dr. J. C. Litzberg, Minneapolis (re-elected).

Alternate, Dr. W. L. Burnap, Little Falls.

DR. DRAKE: I move that the incoming president be authorized to appoint the necessary committees.

Seconded and carried.

Adjournment, 2:15 p. m.

MONDAY EVENING, APRIL 27, 1925

MEDICAL ECONOMICS MEETING

The meeting on Medical Economics was held in the Auditorium of the Chemistry Building, University of Minnesota, on Monday evening, April 27, 1925, and was called to order at 8:00 o'clock by the President, Dr. Willard L. Burnap, Fergus Falls, who then turned the meeting over to the Secretary, Dr. E. A. Meyerding, Saint Paul.

Major Irving M. Madison, U. S. Army, delivered an address on the subject of "National Defense."

Dr. J. A. Myers, Minneapolis, spoke on the subject of "The American Association for Medical Progress," explaining its aims and accomplishments.

Dr. W. C. Woodward, of the Judiciary Committee, American Medical Association, Chicago, delivered an address entitled "Obligations of the Physician."

Mr. George W. Peterson, of Oppenheimer, Peterson, Dickson & Hodgson, Attorneys for the Association, spoke on the subject of "Do's and Don'ts for the Medical Man."

Mr. Fred E. McLucas, Chief Counsel, Medical Protective Company, presented a paper entitled "Corrective Judicial and Legislative Measures."

Dr. Frank Billings, Chicago, presented a paper entitled "Periodic Medical Examinations."

Dr. Herman M. Johnson, Dawson, Chairman, Committee on Public Policy and Legislation, Minnesota State Medical Association, addressed the audience on "State Legislation."

Dr. J. T. Christison, Saint Paul, spoke briefly on the same topic.

Dr. N. O. Pearce, Minneapolis, delivered an address on "The Medical School and Its Relation to the Practitioner."

Dr. Frank J. Savage, Saint Paul, presented a paper on "Medical Radio Talks."

Dr. William J. Mayo, Rochester, moved a rising vote of thanks to the gentlemen on the program for their splendid entertainment.

Motion seconded and unanimously carried, and the meeting was declared adjourned at 11 o'clock.

TUESDAY MORNING, APRIL 28, 1925

JOINT SESSION, MEDICAL AND SURGICAL

The first joint session was called to order in the Auditorium of the Engineering Building, University of Minnesota, at 8:10 a. m., by the Chairman, Dr. Harry P. Ritchie, Saint Paul.

1. Clinic on Tumors of the Lymph Glands:

(a) Clinical Presentation—Dr. J. P. Schneider, Minneapolis, spoke on the medical side of these growths and presented a group of patients.

(b) Surgical Demonstration—Dr. Harry B. Zimmerman, Saint Paul, spoke on the surgical side and demonstrated a group of patients.

(c) Roentgenological and Radium Treatment—Dr. A. S. Fleming, Minneapolis, reviewed this subject and presented a series of lantern slides.

(d) Pathological Demonstration—Dr. E. T. Bell, Minneapolis, described the pathological findings and presented a series of lantern slides.

At the close of this clinic Dr. Ritchie declared a recess of ten minutes and invited anyone interested to come forward and examine the patients.

2. Clinic on Bone Tumors:

(a) Clinical Presentation—Dr. H. W. Meyerding, Rochester, discussed the clinical symptoms and findings and presented two patients.

(b) Pathological Demonstration—Dr. A. C. Broders, Rochester, in the absence of Dr. W. C. McCarty, spoke of the pathological findings and presented a series of lantern slides.

3. Tumors of the Breast:

(a) Clinical Demonstration—Dr. William D. Haggard, Nashville, Tennessee, discussed the clinical signs and symptoms and presented several patients.

(b) Pathological Demonstration—Dr. W. A. O'Brien, University of Minnesota, reviewed the pathological tumors of the breast and discussed the pathologic findings, showing a series of lantern slides.

As this concluded the program for this session, on motion duly seconded and carried the Association adjourned to meet in separate sections at 2:00 p. m.

TUESDAY AFTERNOON, APRIL 28, 1925

MEDICAL SECTION

Chairman, Dr. L. G. Rowntree, Rochester; Secretary, Dr. F. J. Hirschboeck, Duluth.

The first meeting of the Medical Section was held Tuesday afternoon, April 28th, at 2 p. m., in Room 104 Anatomy Building, University of Minnesota.

Dr. M. J. Kern, St. Cloud, presented a paper on "The Medical and Roentgenological Management of Hyperthyroidism," which was discussed by Dr. E. T. F. Richards, St. Paul; Dr. H. L. Ulrich, Minneapolis, and by Dr. Kern in closing.

Dr. A. W. Adson, Rochester, discussed "Surgery in Spinal Cord Tumors."

The Chairman introduced the past President of the American Medical Association, Dr. Frank Billings, of Chicago, who said a few words of greeting.

Dr. C. S. McVicar, Rochester, discussed the "Management of Toxemia Associated with Gastric Stasis, Obstructive and Non-Obstructive," which was discussed by Dr. D. C. Balfour, Rochester, and Dr. E. L. Tuohy, Duluth, Dr. McVicar closing.

Dr. H. S. Diehl, University of Minnesota, presented "Observations on the Chlorine Treatment of Acute Respiratory Infections." In the absence of Col. E. B. Vedder, of Washington, the secretary read a letter from him on this subject. After discussion by Dr. J. A. Myers, Minneapolis, and Dr. E. D. Anderson, Minneapolis, Dr. Diehl closed.

Dr. W. A. Jones, Minneapolis, gave a "Discussion of the Care and Treatment of the Psychoneurotic." The subject was further discussed by Dr. Frederick Moersch, Rochester; Dr. E. L. Tuohy, Duluth; Dr. Frank Billings, Chicago; and Dr. Arthur Sweeney, St. Paul.

Dr. S. E. Sweitzer, Minneapolis, gave a lantern slide demonstration of "Phases of the Smallpox Epidemic," which was commented on by Dr. O. N. McDaniel, Minneapolis; Dr. H. E. Michelson, Minneapolis; Dr. Ralph T. Edwards, Elysian; and by Dr. Sweitzer in closing.

Dr. Everett K. Geer, St. Paul, presented the moving picture film on "Pathology and Diagnosis of Pulmonary Tuberculosis," prepared by Dr. Lewis Gregory Cole, of New York City.

Adjournment.

TUESDAY AFTERNOON, APRIL 28, 1925

SURGICAL SECTION

The first session of the Section on Surgery was held in the Auditorium of the Anatomy Building, University of Minnesota, and was called to order at 2:05 p. m., by the Chairman, Dr. Harry P. Ritchie, St. Paul.

Dr. F. E. B. Foley, St. Paul, presented a paper entitled "Embryology of the Upper Urinary Tract Anomalies, Report of Cases."

Dr. John M. Culligan, Rochester, presented a paper entitled "Ureteral Stone."

Dr. Gilbert Thomas, Minneapolis, presented a paper entitled "Diagnosis of Renal Tuberculosis," with lantern slides.

Dr. William F. Braasch, Rochester, presented a paper on "New Antiseptics, Their Value."

These four papers were discussed by Drs. Franklin Wright, Minneapolis; A. G. Wethall, Minneapolis; and in closing by Dr. Thomas.

Dr. A. C. Broders, Rochester, presented a paper on "The Grading of Cancer."

Dr. A. C. Strachauer, Minneapolis, presented a paper on "Cancer of the Intestinal Tract."

These two papers were discussed by Dr. C. B. Lewis, St. Cloud, and in closing by Dr. Strachauer.

Dr. John E. Evert, St. Paul, presented a paper entitled "Tumors of the Thymus." Discussed by Dr. Moses Barron, Minneapolis.

As this completed the program for this session, the meeting was declared adjourned at 5:00 p. m.

TUESDAY EVENING, APRIL 28, 1925

THE ANNUAL BANQUET

The annual banquet was held at the Radisson Hotel, Minneapolis, at 6:30 p. m.

At the close of the dinner the following program was carried out, with Dr. William J. Mayo as Toastmaster:

"Our Guests," Dr. Emil S. Geist, Minneapolis, President Hennepin County Society.

"Welcome," George E. Leach, Minneapolis, Mayor of Minneapolis.

Solos, Mrs. Mildred Langtry Mehlin, Warren.

"Minnesota," Theodore Christianson, St. Paul, Governor of Minnesota.

"The State Society," Dr. W. L. Burnap, Fergus Falls, President State Society.

"Experiences with the Legislature," Herman M. Johnson, Dawson.

"The Medical College," Dean E. P. Lyon, Minneapolis.

"Medical Practice Today," Dr. Frank Billings, Chicago.

"The American Medical Association and the Future of Medicine," Dr. William D. Haggard, Nashville, President American Medical Association.

WEDNESDAY MORNING, APRIL 29, 1925

JOINT SESSION, MEDICAL AND SURGICAL

The second joint session was called to order in the Auditorium of the Engineering Building, University of Minnesota, at 8:10 a. m., by the Chairman, Dr. L. G. Rowntree, Rochester.

1. Diabetes Mellitus:

(a) Clinical Demonstration—Dr. A. H. Beard, Minneapolis, discussed the Arteriosclerotic Conditions of Diabetes, and presented a group of patients.

(b) Surgery in the Diabetic was discussed by Dr. A. A. Law, Minneapolis.

2. Diseases of the Thyroid:

(a) Clinical Demonstration—Dr. Henry S. Plummer, Rochester, spoke of the great advances made in the knowledge of these diseases and presented a group of patients.

(b) Surgical Considerations—Dr. J. DeJ. Pemberton, Rochester, discussed the surgical possibilities and presented a series of patients and lantern slides.

3. Diseases of the Other Glands of Internal Secretion:

This subject was presented by Dr. H. L. Ulrich, Minneapolis, and at the close of his address the chairman requested Dr. Frank Billings, Chicago, to continue the discussion. Dr. Rowntree then made the closing remarks, at the request of Dr. Ulrich.

At this point the clinical session was interrupted for the Installation of Officers.

4. Clinic on Neurology:

(a) Dr. A. S. Hamilton, Minneapolis, discussed "Nervous Disorders in Pernicious Anemia," and presented a group of patients.

(b) Dr. J. C. McKinley, Minneapolis, discussed "Early Tabes Dorsalis," and presented a series of patients.

These two presentations were discussed by Dr. Frank Billings, Chicago.

(c) Dr. E. M. Hammes, Saint Paul, spoke of "The Sequela of Encephalitis," and presented a group of patients.

(d) As Dr. A. W. Adson, Rochester, was unable to be present the topic of "Surgery in Spinal Cord Tumors" was not discussed.

(e) Dr. Smiley Blanton, Minneapolis, discussed the various types of "Speech Defects," and presented a group of patients.

As this concluded the program for this session, on motion duly seconded and carried the Association adjourned to meet in separate sections at 2:00 p. m.

A short general session at which Dr. Burnap presided was held at 10:45 a. m.

After some preliminary remarks the attention of the members was called to the fact that Dr. Sidney S. Hall, formerly of Ripon, Wisconsin, and a member of the Wisconsin State Medical Association since its inception, at one time president of the association and for thirty-five years its treasurer, is now living in Minneapolis. Dr. Hall, being present, was called upon and duly elected an honorary member of the Minnesota State Medical Association.

Dr. H. M. Johnson, president elect, was then escorted by Dr. Theodore Bratrud and Dr. C. B. Wright to the platform and duly installed.

WEDNESDAY AFTERNOON, APRIL 29, 1925

MEDICAL SECTION

Chairman, Dr. L. G. Rowntree, Rochester; Secretary, Dr. F. J. Hirschboeck, Duluth.

The second meeting of the Medical Section was held Wednesday afternoon at 2 p. m. in Room 104 Anatomy Building.

Dr. O. E. Locken, Crookston, spoke on "Public Health—A Challenge to the Medical Profession," which was discussed by Dr. F. R. Weiser, Windom, and Dr. A. J. Chesley, Minneapolis, Dr. Locken closing.

Dr. Woodard Colby, St. Paul, discussed "The Dick Test, Immunization of Scarlet Fever," which was commented upon by Dr. E. S. Platou, Minneapolis; Dr. E. J. Huenekens, Minneapolis; Dr. W. P. Larson, Minneapolis; and Dr. Colby in closing.

Dr. Harry Oerting, St. Paul, presented a paper on "The Use of Novasurol as a Diuretic." This was discussed by

Dr. N. M. Keith, Rochester; Dr. L. G. Rowntree, Rochester; Dr. Oerting, and Dr. Frank Billings, Chicago.

The chairman announced that St. Louis County has one hundred per cent membership and requested Dr. F. H. Magney, of Duluth, to tell how they did it.

Dr. Arthur Sweeney, St. Paul, discussed the "Psychology of Compensation Neurosis," on which Dr. A. S. Hamilton, Minneapolis, and Dr. W. H. Hengstler, St. Paul, commented; Dr. Sweeney closing.

Dr. Paul G. Boman, Duluth, spoke on "Postoperative Pulmonary Complications." The subject was further discussed by Dr. H. E. Richardson, St. Paul; Dr. N. M. Keith, Rochester; Dr. G. D. Head, Minneapolis; Dr. L. A. Nippert, Minneapolis; Dr. Mary S. Whetstone, Minneapolis; and Dr. Boman.

Dr. H. I. Lillie, Rochester, presented a paper on "Effect of Environment upon the Upper Respiratory Tract and Clinical Significance," which was discussed by Dr. J. A. Pratt, Minneapolis; Dr. Horace Newhart, Minneapolis; and Dr. Lillie in closing.

Dr. F. L. Adair, Minneapolis, gave an illustrated talk on "Causes of Death in the Fetus and Newborn; Based on 450 Necropsies." Dr. W. A. O'Brien, University of Minnesota, performed an illustrative autopsy on a fetus; and Dr. Roger Kennedy, Rochester, further discussed the subject.

Adjournment.

WEDNESDAY AFTERNOON, APRIL 29, 1925

SURGICAL SECTION

The second session of the Section on Surgery was held in the Auditorium Anatomy Building, University of Minnesota, and was called to order at 2:00 p. m., by the Chairman, Dr. Harry P. Ritchie, St. Paul.

Dr. F. C. Schuldt, St. Paul, presented a paper entitled "Tumors of the Testes—Malignant and Inflammatory" (lantern slides). Discussed by Drs. E. T. Bell, Minneapolis; Gilbert Thomas, Minneapolis; and in closing by Dr. Schuldt.

Dr. Theodor Bratrud, Warren, presented a paper on "The Treatment of Acute Appendicitis." Discussed by Drs. Donald K. Bacon, St. Paul; Frederick J. Plondke, St. Paul; and in closing by Dr. Bratrud.

Dr. J. S. Holbrook, Mankato, presented a paper entitled "Perforated Gastric and Duodenal Ulcer." Discussed by Drs. James E. Arnold, Vernon Center; W. A. Coventry, Duluth; H. B. Sweetser, Minneapolis; Frederick A. Olson, Minneapolis; C. B. Wright, Minneapolis; A. E. Benjamin, Minneapolis; and in closing by Dr. Holbrook.

Dr. F. C. Mann, Rochester, presented a paper entitled "Production and Healing of Peptic Ulcer; Experimental Study." Discussed by Dr. E. T. Bell, Minneapolis.

Dr. Archa Wilcox, Minneapolis, presented a paper entitled "Splenectomy for Hemolytic Jaundice, with Report of a Case." Discussed by Drs. Arthur W. Collins, Duluth; and H. M. Conner, Rochester.

Dr. T. L. Chapman, Duluth, presented a paper on "The Lowering of the Mortality in Toxic Adenoma of the Thyroid." Discussed by Dr. Henry S. Plummer, Rochester.

Dr. Wallace Cole, St. Paul, presented a paper entitled "Clinical and Roentgenologic Differentiation of some Apparently Similar Bone Lesions." Discussed by Dr. Charles A. Reed, Minneapolis.

As this completed the program, the chairman expressed his thanks to the Secretary of the Section, Dr. O. J. Hagen, for his valuable assistance, and the meeting was declared adjourned at 5:25 *sine die*.

MINNESOTA MEDICINE

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MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association
Northern Minnesota Medical Association and Minneapolis Surgical Society*

VOL. VIII

AUGUST, 1925

No. 8

THE PSYCHOLOGY OF COMPENSATION NEUROSIS*

ARTHUR SWEENEY, M.D.
St. Paul, Minn.

When one falls downstairs in his own house, he nurses his bruises and in a few days gets well. When a public service corporation, through negligence, inflicts similar injuries, he does not get well, but develops a symptom complex known as litigation neurosis. Why this difference in reaction to identical injuries?

It is wholly due to the psychological reaction. It is a mental and emotional process in which many factors are operative. Given an accident in which no severe bodily injury is received, but in which slight bruising is attended by fright shock that surrounds most railway injuries, we have conditions that easily and naturally lead to an emotional hyperexcitability. There is no physical shock to depress the activity of the nervous system, no loss of blood to exhaust the strength, no unconsciousness to modify our susceptibility to impressions, and no actual pain to absorb our attention in a concrete manner. Consequently our emotional nature is wide awake and impressionable. There is an acute perception of the surroundings of the accident, a vivid realization of the horrors of other people's injuries, an active consciousness of what might have happened, and a sense of self-congratulation on the narrowness of the escape. To pass through such an occurrence without experiencing fear would be practically impossible, unless one has his emotional nature well under control.

After the accident it is discussed with relatives and friends. The details are described with infinite precision. Its horrors are depicted with lurid description. The victim, already shaken by the primary emotional shock, is further shaken by the sympathetic and ill-judged curiosity of the relatives and friends, who ply him with questions and re-

marks which tend to fix upon his mind the unpleasant details of what has happened. He goes to bed, but sleep deserts him, and he acts the scene all over again in the restless hours of the night.

At this early period two emotions possess him. One is fear, which from the start has dominated him. The other is resentment, gradually increasing, against the negligence which allowed the accident to happen. He begins to feel that "they" had no right to allow the condition causing the accident to exist. "They" had no right to jeopardize the lives of their passengers. These emotions now begin to be accompanied by certain physical symptoms. The head aches, and there is a nervous feeling down the spine, later to be replaced by pain and tenderness. There are physical weakness, a sense of mental fatigue, and a tendency toward irritability and lack of control of the feelings under expressions of sympathy. After a few days these symptoms become pronounced, and the patient is reduced to the more or less marked condition of neurasthenia so often met with.

About this period the claim agent makes his appearance, and talks in a friendly way about the legal aspects of the case. He is too friendly, and the sick man fears a trap to inveigle him into some statement unfavorable to his case; or he is too abrupt and offensive, and in this he sees a practical denial of liability for his injuries, or an assertion that they do not exist, at least in the degree claimed.

The visit of the claim agent is attended by one or two of these emotions. Henceforth his attitude is one of hostility. There is subconscious reassertion of the reality of all the symptoms. Not only are they real, but they are severe, more severe than at first thought. They must mean something radically wrong with the system.

"Why should I feel so badly unless I have something seriously wrong with me? Do not these pains, headaches, numbness, and weakness mean some organic condition from which I may perhaps never get well? Why should I sleep so poorly, dream so much, and awake so unrefreshed?" This is the period of apprehension, in which the patient

*Presented before the Minnesota State Medical Association, Minneapolis, April, 1925.

lives in a condition of uncertainty as to the outcome, tinged with the certainty that the outcome, whatever it may be, will be bad. So far, we have to deal only with fear and resentment, suspicion and apprehension; other emotions, perhaps less innocent, are to follow.

Now come thoughts about compensation. How much? The condition has dragged its weary length for several weeks, and the symptoms are now well developed and established. How much is adequate compensation? That depends! Will I recover? When will I recover? Will my recovery be complete? Will I ever be the same man again? Who is going to pay for my loss of time? My expenses are large, and they must be met. Will I be able to get my job back? Will these symptoms not be liable to recur when I do go back to work? The compensation must be adequate for my losses in the past, for my losses in the future, and for all that I am suffering and have suffered. The mental attitude now becomes hostile. They must pay—they must pay well. But how much? How can I tell how much time I will lose or how much my expenses will be? How can I settle until I know how long I am going to be sick? The thought that comes at this time is, the longer I am sick, the more they will have to pay. Why should I hurry to say that I am well? And so attention becomes fixed on symptoms. Daily self-analysis prolongs the condition, and the mental state, influenced consciously or unconsciously by cupidity, becomes stationary, and no effort is made by the patient to arouse himself from his morbid, emotional condition.

So the condition drags on. Cupidity has now become the ally of fear, resentment, suspicion, and apprehension. Self-analysis increases the suffering. The patient daily compares his present state with his former one, and each analysis increases his certainty of the severity of his condition and warps his judgment of fairness and equity. He has acquired a morbid mental habit, which leads to exaggeration, typical of the traumatic neurasthenic, and he becomes a nuisance to himself and to all about him.

At this period, or earlier, he receives a visit from a friend of a lawyer, who has recovered prodigious verdicts in cases not half as bad as his. He shows him photographic reproductions of checks in settlement of verdicts obtained by the legal luminary in other cases. If he can do it in these cases, why

cannot he recover a larger amount in this much more serious case? Would he not just talk with the lawyer and let him tell what he could do for him? And finally he signs a contract giving 50 per cent of the prospective damages to the lawyer.

After the client is fairly hooked, the lawyer does not apparently hurry toward the settlement of the case. The law's delays are many, and in the months in which the case drags the symptoms might naturally disappear. And they do frequently disappear, but the plaintiff cannot now afford to admit it. He must go on, after his condition has largely disappeared, claiming still to suffer with the acuteness of the first few weeks. He cannot now afford to admit that he is well. If he improves, he diminishes the amount of compensation he will get. He continues to complain and to exaggerate. The phase between exaggeration and malingering is like that between daylight and darkness. One cannot tell when the one leaves off and the other begins. He is, however, susceptible to adverse suggestion, and under the mere suggestion of the attorney weakness becomes paralysis, frequency of urination becomes incontinence, and the picture of neurasthenia gradually begins to merge into that of organic disease.

Before the trial he must be examined by the defendant's physicians. He realizes that it is a test of wits. He is alert and clear minded, fencing shrewdly for advantage in the description of subjective symptoms, at no time admitting any improvement, and insisting on a detailed description of the severity and reality of all that he has suffered. He is not to be caught off his guard, and he reinforces his statements by appropriate facial expressions, indicative of the severity of his pain. His back pains him, and every movement is guarded by rigidity of the *erectores spinæ*. His leg is helpless, and he allows pins to be stuck into it without flinching. He acts the part as naturally as he can, and he sticks by the assumed symptoms, with as great vigor as by those which were in the early stage the real ones. His sickness is not now a mere malady. It has become a battle—a contest in which there is a prize to be won by shrewdness and determination; and in which he realizes he has an advantage before the jury.

After the verdict, which is seldom as large as his cupidity desires, he has at last something definite to look forward to. So has the lawyer. If the case is appealed he cannot afford to get well before

the next trial, and he keeps up the appearance of invalidism, as best he can, long after his symptoms have ceased to be real and when memory of past sufferings has to be galvanized into actuality by forced imagination. He is weary of the struggle, but cannot give in. If the case is promptly settled after the verdict the conditions are different. He has won! The moral effect of this cannot be underestimated. Unacknowledged, he has been waging a battle, and he has had a victory. At once the mental state changes. From one of fear and apprehension, it has changed to optimistic certainty. All doubts are dispelled. He can now free himself from the morbid mental habit of months and can think of happier things than pain and suffering. The mind is absolved from the resentment which it has secretly entertained for months. The antecedent depressing conditions have disappeared, and he can calmly look forward to returning to work and resuming his normal life.

DISCUSSION

DR. A. S. HAMILTON, Minneapolis: It has been a pleasure to listen to Dr. Sweeney's exposition of this subject. By virtue of his numerous years in practice, his long experience in teaching medical jurisprudence at the University, his frequent appearance in cases of this sort where the compensation element is involved, and by virtue of a rather genial personality it always seems to me he gets a little closer to his patients even on the adverse side than most doctors can. I think he is in a position to speak with more authority on this than almost anyone else, in this part of the world anyhow. His statement of the case is very clear and convincing, very complete.

Dr. Sweeney has pointed out the fact that these people are not to be looked upon as dishonest merely because they seem to be presenting claims in excess of what perhaps the physician may think is fair, but there are valid reasons for that. In my experience a pure malingerer is a rare individual, an uncommon individual. By pure malingerer I mean a man who malignantly sets out with the purpose to defraud a company, and, with no injury at all or with an injury that is so slight that it is of no significance or with a purely manufactured injury, lays claim to very high damages. There have been a few of those cases. For instance one was a man who broke his back—for the fourth time—and crushed his cord, miraculously broke his back and crushed the cord again—we didn't see him that time—and broke his back a sixth time and crushed his cord, and I am expecting to see that man again. I am convinced he is going to try that trick again. A man won't stop the sixth time.

Now, there are very few cases I would say of pure malingerer, but the idea of more or less conscious deceit—I say more or less because it is always difficult to say how much consciousness there is in the element—certainly enters into many compensation cases. One will be a little more chari-

table with these people if one only recalls that deceit is a very common idea in the world. You know there is a certain group of medical men who practice according to the so-called Freudian psychology, and one of the methods of getting out the facts is to surprise them out of the fellow. You have to assume that the man won't tell you the truth even with no object apparently except to save his own dignity or something like that. To get him to tell the truth you have to have him lie down on the couch and fold his hands and compose himself and say exactly what comes into his mind, but if you sit face to face with him he won't tell the truth.

So I say deceit is very common in life and we must not blame these people too much. Besides, there are many things that can hardly be classed as deceit that tend to aggravate the claims of the patients. For instance, most patients do not realize that illness somehow gets well gradually. We aren't ill today and then wholly well tomorrow, but we are just a little bit better or worse tomorrow, as the case may be. And so a man who has an injury of a certain sort goes about; he is still a little bit stiff somewhere in his arm or his leg and perhaps he has even a little pain, and as long as that thing is there he considers that he is the victim of this accident, and that is the way it goes on. The man doesn't recognize that if he would just go back to work in a short time the stiffness will disappear and the pain is gone and he is just as he was before.

DR. W. H. HENGSTLER, St. Paul: The very able presentation of this subject by Dr. Sweeney leaves very little to be added. I should like to mention as evidence of what Dr. Sweeney has portrayed here the action of some of the men who have returned from the wartime service overseas. For five years, from 1919 until 1924, the sub-district office of St. Paul sent the neurological cases to our office for opinion as to their condition and for a rating. In looking back over these five years I can see a large percentage of these men who fit in very nicely to what Dr. Sweeney has just called to your attention.

It was usually my custom in examining these men to go into the history of things pretty well and to find out just exactly how they felt about the compensation end of it. The average question asked by these soldiers when we would finish with them would be, "Doctor, how much compensation do you think I ought to get?" It was a very rare occurrence to have one of these men ask, "Doctor, do you think I will get well?" It was a question of "how much do you think the government will pay me." If, to draw them out psychologically, we would differ with them on the matter of compensation and say, "Oh, I don't see why you should get any compensation," then they would simply spring into the hostile attitude which Dr. Sweeney has portrayed. *They* went to Europe, the government dragged *them* into the service, *they* paid so much a month, for their insurance, and *they* couldn't work, therefore they ought to be paid.

The government has a system of rating men: temporary disability or total disability or permanent disability. When these cases were settled on a temporary basis the greater percentage of them would straighten out very nicely. If they were in vocational training they would go ahead very nicely. They would report back to the office once a month

or once in two months for an examination and we would find they were getting along nicely. But just the minute the temporary rating ran out and the question of permanent rating came up, then they would get worse again. All the old symptoms would crop up and it would be a question of getting affidavits and producing evidence to show why they should receive a permanent rating. Peculiarly enough, as Dr. Sweeney has brought out, these were not the men who were badly hurt but they were the men in whom there had been a minor injury with a large amount of nervous shock.

I bring this point out not in criticism of the ex-service men but merely as evidence to show that the compensation neurosis exists wherever there is a basis for the least amount of compensation, because no man who served for the government could receive any more than \$150 a month. The majority of them received a smaller amount.

Those of us who are doing this neurological work know that we are continually beset by ambulance-chasing attorneys to take cases against corporations in which there is a faint hope or a fair chance of getting compensation. The attorney fans into flame the spark of resentment in the individual and thereby produces the compensation neurosis.

DR. ARTHUR SWEENEY (closing): I have only a word to say in closing and that is that in these cases in which injury occurs and to which compensation is attached we should recognize the fact that a man is not a mere physical being but that he is a mental animal as well, not only a mental animal but an emotional animal, for a man uses his emotions ninety-five times where he uses his reasoning powers once. If we recognize in the examination of these cases the psychological basis of symptoms, assume an optimistic rather than a pessimistic attitude as to the recovery, we are doing a real service to the individual. Unfortunately a great many doctors do not adopt that attitude and tend to increase the emotional distress of the patient by agreeing with him as to the severity and seriousness of his trouble.

"P-O-4" Not Admitted to N. N. R.—The Council on Pharmacy and Chemistry reports that "P-O-4" is the proprietary non-descriptive designation under which Lehn & Fink, Inc., New York, market a preparation alleged to be a mixture of two parts of tribasic magnesium phosphate and one part of tribasic calcium phosphate. The preparation is claimed to be a "therapeutically balanced" mixture which is "A New Antacid for symptoms of hyperacidity, such as 'acid' stomach, pain, heartburn, acid regurgitation, distress and gas." The Council explains that, in order that a correct estimate of the therapeutic value of tertiary magnesium phosphate and tertiary calcium phosphate may be gained, it is important that physicians use them under their proper names and base the selection of one or the other on the requirements of the particular patient. The Council found "P-O-4" inadmissible to New and Non-official Remedies because the use of a mixture of tertiary calcium phosphate and tertiary magnesium phosphate in fixed proportions under a non-descriptive name is irrational and the claim that it is "a therapeutically balanced" mixture is unwarranted. (Journal A. M. A., Sept. 13, 1924, p. 861.)

PUBLIC HEALTH—A CHALLENGE TO THE MEDICAL PROFESSION*

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The science of medicine in the last twenty years has developed by such gigantic strides that in every respect it is parallel to if not in advance of the tremendous development in the industrial and mechanical world. The achievement of scientific discovery in the diagnosis and treatment of disease is a romance of interest beyond the appreciation of human thought and yet the medical profession today stands before the public an object of criticism more severe than at any time since the first struggle to separate medical progress from the priesthood. In the public press and platform the medical profession is presented to the popular fancy as an assembly of men similar to the United States Senate, a continual target for a barrage of jokes, light humor and sarcasm. As individuals we are granted the fair respect offered to educated people, but as an organization we are accepted with mild reservations, classified as a group of people out of step with modern methods of human contact, bound down by a system of ancient ethics which are as unchangeable as the tides, forbidding us to speak in a language understandable by the mere public, cloaking our knowledge in secrecy on the supposition that the facts of medicine are for the scientific mind and not for the common herd.

Dr. McCormick of Kentucky, noted public health leader, recently said "that the advance in requirements for medical practice had been so rapid that the doctor was appalled at the extent of science he had to learn and as a consequence had seemed to devote himself to science rather than humanity. He is better prepared today than he ever was before in the history of the world to diagnose, treat and prevent disease, but the people among whom he practices do not know it. He talks in terms they do not understand, forgetting that any quack can use as big words as the best doctor. He sits in his office, in the hospital, in the medical college, a recluse. The plain fact is that the modern doctor has to be humanized before the public has the confidence in him it ought to have and it used to have."

*Read before the Minnesota State Medical Association, Minneapolis, April, 1925.

Medical education is coming in for its share of the criticism. Dr. Arthur Bevan of Chicago, noted medical educator, recently expressed a widely prevalent idea: "85 to 95 per cent of cases of disease can be and are cared for by the general practitioner. Five to 15 per cent are and should be cared for by the specialist."

Dr. Witherspoon of Nashville, discussing this subject, declares, "In the face of this, the teaching is almost entirely by the specialist and full-time instructor. There is too little viewpoint of the physician and his relation to the patient and the public and there is too much fundamental science and too little application to medical problems. There is no vision of the community to be served or the practice to be developed."

An intelligent educated layman, M. W. Forbush, writing in the *Journal of the American Medical Association* on "How the Doctor Looks to the Layman," stated: "He is too matter of fact in his diagnoses, too dependent on mere materia medica for his cures. The modern physician ought to realize more deeply and minister more wisely to the ignorance rather than only to the sickness of the average person. There should be a popularizing of medicine through friendly co-operation of local medical societies to call the doctor more often when well and less often when sick—to teach us regimen of living and how to prolong life joyously instead of to eke it out. The intelligent layman is ready for a national campaign of health education."

A recent editorial in our own *Journal-Lancet*, commenting on the fact that the average attendance at our state medical association meetings was 350 out of some 1,900 physicians, stated: "The committee who have the whole matter in charge have realized for some time that the medical profession of Minnesota are still asleep and that they need a decided arousing and awakening. It is partly indifference, partly laxness, and partly their own idea of their superiority when they neglect their medical journals and their medical meetings."

Anyone who has had any experience with medical questions before the legislature appreciates fully the soundness of the criticisms presented against the failure of the medical profession in its contact with the public.

Because thinking men have believed that medical practice, as such, is incapable of serving fully the demands of the public health, we have witnessed

in recent years the development of numerous agencies to administer to special problems of health on the underlying theory that where the public can handle a problem better, the public finds a way.

1. The State of Minnesota maintains a special hospital for its indigent crippled children, and this finds new forces in the Shriners' hospital and the coming Eustis and Dowling institutions.

2. The state provides a state tuberculosis sanatorium and together with the several counties maintains fourteen county sanatoria for tuberculosis for both free and pay patients.

3. The State of Minnesota maintains a general hospital at the University for both free and pay patients.

4. The University again by private endowment is soon to open a special cancer institute on its campus.

5. Public health nurses are increasing in number; the total today active in the field of socialized medicine in Minnesota are 334, of which 210 are in the three large cities and 124 in the rest of the state, instructing and guiding the public in its problems of individual and community health.

6. Under Federal aid, through the Shepard-Towner Act, the Maternal and Infant welfare activities are spreading throughout the state by free clinics and extension courses from the University direct to the mothers and we have a special director of this department associated with the State Board of Health.

7. In the particular field of venereal disease control, the state again supervises the diagnosis and treatment by special legislation, and a special department director compels the physician to give special literature to every venereal patient.

8. Then we have the general welfare agencies, the Red Cross, and the Minnesota Public Health Association with its active county units spreading its activities in health education, from tuberculosis to all the problems of physical fitness.

9. Now we hear new developments of child guidance clinics aiming to solve the problem of mental deviates in the public schools and we find an increasing demand for a state institution of Psychiatry, where early mental cases can be treated with the hope of reducing the demands on the state hospitals for the insane.

What is the significance of this altruistic and paternalistic tendency in disease control? What

challenge does it bring to a thinking medical profession? Before we can answer these questions let us review the achievements and limitations of modern medicine as we read them from the reports of Vital Statistics:

TABLE I				
IMPORTANT DISEASES OF DECREASING DEATH RATES				
Disease	Year	United States Rate per 100,000 Pop.	Year	Minnesota Rate
Typhoid Fever	1900	39.9		
	1910	22.8	1910	32.1
	1920	7.6	1920	3.0
			1924	1.46
Diphtheria	1900	43.3		
	1910	21.1	1910	26.1
	1920	15.4	1920	10.3
			1924	8.57
Tuberculosis	1900	201.9		
	1910	154.9	1910	109.0
	1920	113.2	1920	89.5
			1924	67.39
Diarrhea and Enteritis (under 2 years)	1900	108.8		
	1910	98.8	1910	64.4
	1920	43.3	1920	21.0
			1924	11.77
Pneumonia	1900	180.5		
	1910	100.4	1910	86.7
	1920	133.7	1920	89.0
			1924	70.55

TABLE II				
IMPORTANT DISEASES OF INCREASING DEATH RATE				
Disease	Year	United States Rate per 100,000 Pop.	Year	Minnesota Rate
Scarlet Fever	1900	10.2		
	1910	11.7	1910	14.5
	1920	12.5	1920	4.8
			1924	8.17
Nephritis	1900	89.0		
	1910	111.4	1910	70.9
	1920	103.4	1920	83.3
			1924	58.34

Cerebral Hemorrhage				
Apoplexy	1900	67.5		
	1910	75.9	1910	42.6
	1920	81.0	1920	60.1
			1924	
Heart Disease	1900	123.1		
	1910	142.3	1910	81.5
	1920	141.8	1920	113.7
			1924	135.69
Cancer	1900	63.0		
	1910	76.1	1910	67.2
	1920	83.4	1920	95.4
			1924	101.04

TABLE III			
FIVE PRINCIPAL CAUSES OF DEATH IN UNITED STATES FOR YEAR 1920			
	United States Rate per 100,000 Pop.	Minnesota Rate	
Organic Heart Disease	142.3	113.7	
Pneumonia	138.7	89.0	
Tuberculosis	113.2	89.5	
Bright's Disease	103.4	83.3	
(Acute and Chronic)			
Cancer	83.4	95.4	

What conclusions can we logically make from these figures?

In Table I, the reduction in the mortality of typhoid fever has been made not through superior diagnosis or treatment, but by pure water and milk supplies principally. The reduction in diphtheria mortality has been subsidized by the state providing free antitoxin for every community and establishing laboratories for culture diagnosis. There is no excuse for 217 deaths from diphtheria in Minnesota in 1924. The Schick test for susceptibility, toxin-antitoxin for prevention and antitoxin for treatment should shame a physician to disgrace for a prevailing 15 per cent mortality rate. Tuberculosis need not wait anxiously for further reports on the Mollgaard gold cure method. With a decrease in the death rate of 50 per cent in 20 years with the present approved methods it is merely a question of greater effort.

Diarrhea and enteritis have succumbed to pure milk and anti-fly campaigns. Pneumonia incidence decreases as the hygienic habits of living and labor

are improved and the common cold is treated intelligently.

But what of Table II? Here we have no assistance from Public Health Education or Propaganda, state subsidy or altruistic agencies. Scarlet fever, through the brilliant achievements of the Dicks, will soon take its place in Table I, dependent largely on how active an interest the profession takes in the use of the established means of its prevention among the proven susceptibles.

But in spite of our scientific achievement in pathology, immunology and physiology, the ghosts of nephritis, cerebral hemorrhage and apoplexy, heart disease and cancer go marching on without hindrance. What answer is the medical profession going to give to an informed public who will soon demand a better solution of the problem of these diseases?

Before answering this question there is one problem further to be mentioned. The question of rural health compared to urban health. Dr. Charles Mayo recently stated in a public address that the city youth today was healthier than his country cousin. The army draft of the world war indicated a greater percentage of defective young men from the strictly rural population than from the cities. Death rates in large cities have been constantly falling, whereas the death rates in rural America have not shown a proportionate decrease. In recent years the death rate of the city of New York with all its slums has been lower than the death rate in rural New York. In 1921, for the first time in the history of accurate statistics in the United States, we find a higher death rate for babies under one year of age in rural America as compared with urban America. A recent survey in the University of Minnesota by Dr. Diehl analyzing 3,478 physical examinations of male students showed a much higher proportion of physical defects in students coming from rural communities than from the cities with a population above 50,000.

As a solution for the failure of rural America to be supplied with adequate health information and protection a new movement has developed in eastern and southern states under the influence of the International Health Board, formerly the Rockefeller Foundation, co-operating with the United States Public Health Service, in establishing full-time county health organizations capable of carrying into the remote rural communities all

the information of modern health education. A recent effort to permit such an organization to be established in Minnesota, to take the place of the present inadequate township system of health supervision, failed in the present legislature largely by the testimony of the only physician member of the legislature standing before the public health committee declaring that present conditions of health supervision were satisfactory, and that any added expense in promoting further health activities of this type would be unnecessary and uneconomical. Minnesota will take its place among the enlightened states when the public learns the value of these health measures, for then that public will demand for itself what the organized profession is not giving it.

In presenting an answer to the challenge of the problem of the increasing death rates listed in Table II, in meeting the challenge of physical defects in apparently healthy persons of either school age or maturity, the leaders of the American Medical Association have begun a campaign to enlist the interest of the medical profession and the public in the latest weapon against disease, the periodic medical or physical examination. Early recognition of defects and early institution of treatment, which has proven so effective in the warfare against tuberculosis, now is to be used against nephritis, hypertension, cardiac disease and apoplexy just as it is already launched against cancer by the National Cancer Association. The helplessness of our present methods of combating these diseases is apparent. The possibilities of this new viewpoint are as great as we have the energy to make them.

Dr. Dodson of Chicago asks these questions: "Is the medical profession as now constituted prepared to meet this demand which to some degree it must create? Is the average family physician so educated as to the facts and possibilities of preventive medicine that he can render as effective service in this line as he is supposed to render in curative medicine? It must be acknowledged that he is not."

Here is a challenge to the rank and file of our profession. If we are not prepared we must take steps to remedy our weakness. The practicing physician must either gain his information from special postgraduate short courses or through the established health journals which are presenting the new truths of hygiene and physical fitness in

attractive form for both the profession and the laity.

Medical students of the future must have a revision of training, not with the addition of new courses in public health, but with a change of attitude on the part of the instructors in every course to stress the importance of preventive measures in every disease.

Standards for records of histories and physical examinations can best be obtained from the systems recommended in the hospital standardization plan of the American College of Surgeons, and the new records for periodic examinations now issued from the central office of the American Medical Association.

Having prepared ourselves to render service, the public fear of medical examination which is born of ignorance must be overcome by education. The place to overcome this is largely in the schools, where the coming generation is being given its ideas. A public so poorly educated in the science of disease prevention and treatment as we have today cannot distinguish between the judgment of a physician and a chiropractor. We cannot longer afford to call the public health activities socialistic or bolshevik. The demand for them is imperative and will continue to multiply. The time cannot be far away when periodic health examinations will be as common as dental prophylaxis is today.

As a profession we have been laboring too much as a defense organization. The rules that govern medicine in law are made by those outside the profession without our aid. We can and must assume a leadership of this advancing trend of public health and preventive medicine. Such leadership will bring the largest possible service to the people and will conserve for the profession its dignity and compensation.

Our own state medical society with the broadly balanced program offered this year, and the employment of the services of a secretary jointly with the Minnesota Public Health Association, indicate that the medical leaders of the state have seen the light. The challenge remains for us, the rank and file of the practitioners of medicine, to widen our vision accordingly.

DISCUSSION

DR. F. R. WEISER, Windom: I don't know as I am capable of giving the paper its proper discussion, but there was a point that came to my mind as the Doctor was reading his paper, and that was the manner in which we are

handling our cases throughout the southern portion of the state, and especially throughout Cottonwood County. We found down there that the county nurse has been a great factor in helping to solve many of our difficulties, especially in bringing to our attention cases that were a little bit peculiar in their characteristics that probably county nurses didn't fully understand. We found that cases throughout the field, and especially through the public schools where cases came up, would be referred back to physicians, and in that manner the case would be traced to its source.

Some years ago throughout our public schools we had an epidemic of diphtheria. We couldn't trace it. We didn't know just exactly where it came from, but we believed that there were certain individuals in our community that were carriers of this disease. We, therefore, got the physicians of the community together and we went through the entire public school system. There we found four carriers of diphtheria. We quarantined them and administered the proper serum for their cure, etc. We have stamped out diphtheria in our community, so that I doubt if there has been a case in the city of Windom in the last eight or ten years.

DR. A. J. CHESLEY, Minneapolis: In relation to Dr. Locken's chart: the reduction in the typhoid fever death rate reflects great credit on the practitioners throughout the state, for the family physician is the first line of defense for the public and with his intelligent co-operation the municipal and state health authorities have been able to bring about this reduction in typhoid fever. To be sure, most places in Minnesota now have public water supplies that are absolutely safe and the majority are so constructed that under no circumstances will they be likely to become polluted.

In relation to milk supplies, the situation is not as good. Milk supplies need improvement in nearly all places in the state. Only a small proportion of the cities and villages in Minnesota enforce pasteurization and under present conditions pasteurization is the practical method for protection of the public milk supplies.

But the fundamental thing in the reduction of the typhoid fever rate is the work conducted by the Division of Preventable Disease under Dr. O. McDaniel in tracing typhoid carriers. Minnesota probably has identified a larger number of typhoid carriers than any other state. One hundred and twenty-nine carriers have been identified to date through laboratory examinations following field investigations of typhoid outbreaks. To these 129 chronic carriers have been traced 647 cases, including 45 fatalities. The first official acknowledgment by the legislature of this work was made recently, when \$6,000 per annum was appropriated to the Industrial Commission to be used at the suggestion of the State Board of Health for financial aid to carriers who seriously lose on their income through the restrictions imposed for the protection of the public. This fund is administered by the Industrial Commission at the request of the State Board of Health because the Board did not desire to decide the amount of compensation or details of that character. The Board will give all the information regarding the carriers to the Industrial Commission. For example, a typhoid carrier who is a cook finds it very difficult to adjust himself to any other occupation and get

an income comparable to what he received as a cook. Yet it is necessary for the protection of the public that he shall not be allowed to handle food that is to be eaten without being cooked after he handles it.

In getting control of typhoid carriers we are cutting out the sources of typhoid infection.

The same might be done to a degree in diphtheria. The difference is that diphtheria carriers are temporary carriers and proper treatment usually will relieve the carrier of the infection, which is not true at present with typhoid carriers. Why toxin-antitoxin immunization has not been taken up more generally in Minnesota is difficult to understand. The legislature provides money for diphtheria antitoxin only. They will appropriate nothing for Schick test material or toxin-antitoxin. They think that each community should decide whether it will provide toxin-antitoxin.

Analysis of the deaths from diphtheria shows a fatality rate of 13.1 among children under five years, while the fatality rate of all cases is only 5.5, or 218 deaths in 3,940 cases in 1924. It is not a reflection on the medical profession that 218 diphtheria deaths occurred in 1924 in Minnesota, because a great many of the fatal cases were children too young to express their feelings to their parents, who let them go until they obviously were very sick before calling the doctor. In the meantime, those few days passed when antitoxin would have neutralized the toxins of the diphtheria germs and saved the child's life. Of course, this appears more often in the rural districts than in the cities. But school doctors and nurses do not reach children under school age and toxin-antitoxin protection must come through the work of the family physician.

Protection for the child against scarlet fever also must come through the family physician. An analysis of the 207 deaths from scarlet fever in 1924 shows a fatality rate of 5.4 among children under 5 years, while the fatality rate of all cases is only 2.04, or 207 deaths in 10,135 cases. Aside from these deaths the disabling complications which so frequently follow scarlet fever should be prevented.

Although Minnesota is very fortunate in having a progressive medical profession and good medical service along health lines, there should be more organized effort, particularly on the part of the county and district societies, to impress upon parents the need for immunization and special protection against exposure to infectious diseases of children under school age.

DR. ROWNTREE: Is there any other discussion? I think that Dr. Locken wished to lay emphasis on public health measures that have to do with these chronic diseases of middle and later life, and I think this paper has been extremely timely. I would suggest to him that he come on the program next year with some definite constructive plans. This is going to be a matter of education of the profession and the public. He has a keen interest and there is a tremendous field for service, and I believe simply to get the ideas across the support will be forthcoming.

I would like to ask Dr. Chesley if he sees anything from the public health point of view, any steps that are being taken or any that he sees may be taken to advantage in connection with this other group of diseases.

DR. CHESLEY: That is difficult to answer. After our recent experience with malignant smallpox I have backslid considerably in my confidence in so-called educational health measures. When antivaccination legislation is introduced and seriously considered in the legislature, antivaccination bills and antimicrobial bills of all kinds apparently taking more time and causing more interest in the legislature than anything that relates to advance in medical science, than anything that can be done for the promotion of health, individual or community, it leads one to suspect that the real moving power is fear, not health education, when anything is done by the individual for his own health or by the community for the public health. People never will be educated out of fear of death and possibly if some of this joyful welfare educational stuff were mixed with a little bit of sudden death it would become more effective.

The cults assure people that the doctors do not know anything and cite one case to prove it and show what the cult can do. At the antivivisection hearing in the legislature a man who ought not to be allowed to run at large takes the floor and talks against Dr. Charles Mayo and his associates here in the University, and the audience and the members of the legislature listen to this fellow with more attention and with greater interest apparently than they do to the best man the medical men can put forth. But during the war or the flu epidemic, when fear was uppermost, nothing was heard about the antis or the cults. Then the doctor was depended upon.

It seems to me that we ought to take advantage of those occasions when the medical profession is conceded to be the sole recourse of the people and to develop that side of the argument and not allow the antis, through organization, to beat the medical profession with high-sounding phrases not backed by facts at all. Dr. Meyers referred to the American Association for Medical Progress and recommended the establishment of a branch of the association in this state. Medical men should take united action in seeing that all educators who are interested in public health problems join the state branch of this association. If that were done it would be a great advantage when anti-medical bills are introduced in the legislature.

As State Health Officer, it is my duty to speak against anti-medical bills, but physicians in general practice hesitate to do so. If the physician represents the state medical society or a county organization, or, better yet, the state branch of the American Association for Medical Progress, the members of which are mostly lay people, it would not reflect upon him if he spoke before the legislature and his words would have more influence with the legislature and the public.

DR. O. E. LOCKEN (closing): When I began the practice of medicine, just a few years ago, one of the first things that struck me was the very common criticism on the part of the average physician against the public because of their failure to appreciate the medical profession and their tendency to run to the cults and the so-called quacks, as we considered them in our own community. I believed that at that time, and I had just as grievous an opinion of the public as the average man who had been out in the field for years apparently had.

I have had occasion in the last few years to change my mind about that. It has been my privilege to have served as chairman of the committee on public health in the League of Municipalities, and I have spoken before the men that represent the marshals and aldermen of our towns in Minnesota for the last three years. I have found the greatest interest in the problem of public health. Beginning that same work in my own community, it has been my privilege to have spoken at a great many organizations in our town on public health, through the means of having served incidentally as a public health officer in that community. I have found a most active interest on the part of the people and appreciation for efforts in public health measures. I have changed my mind about the public.

I don't think we can say, as I know one physician said a few years ago when we tried to interest him in this movement, "The public be damned! We're doing too much for them now on general measures for which we get no reward." Last year we had Dr. Meyerding come up to our local medical society and we had an entire meeting just devoted to this general problem of public health and medical economics. I have found a great change on the part of the physicians in their attitude on this problem in this last year as compared with three years ago. I have incidentally found that as this thing is developing we have less interference and less question of having some of our practice taken away from us by men we feel are inferior or that are teaching people pseudo-science.

I feel that the movement we have started there has been of great good and can be and should be carried out, educating the public. As an internist I have found that my power over these patients of cardio-renal disease and the cases that I have had occasion to send to more renowned physicians have come back to me more unsatisfactory than any other class of patients. I am convinced that I can be of greater service to them and to myself if we can use the same measures against these conditions that I have listed in this paper, and I believe that represents a challenge to the medical profession.

THE ACTION OF QUININE

Quinine has long had some vogue as an antipyretic. It has been given a rather high rating among the fever allaying drugs because of the belief that it acts not merely by depressing the heat-regulating centers, but also by decreasing heat production. For the febrile patient treated with quinine some advantage might accrue from prevention of the undue loss of protein that the heightened tissue breakdown is believed to bring about in fevers. A recent investigation, however, indicates conclusively that in non-malarial febrile conditions it is not possible through quinine therapy to lessen materially the waste of energy or the destruction of body tissue.

(*Jour. A. M. A.*, June 27, 1925, p. 2006.)

If that man may be considered truly great who can make two blades of grass grow where only one grew before, what can be said of those who have made conditions such that only one death now occurs where two deaths occurred fifty years ago?—*Hygeia*.

A CLINICAL STUDY OF COLONIC FUNCTION*

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"The sins of the colon are its diseases, but I sometimes wonder whether it is not more sinned against than sinning, for what with attacks from above with purges, attacks from below with douches, and frontal attacks by the surgeon, its sorrows are numerous and real."

In this humorous vein, Arthur F. Hurst¹ has forcefully directed our attention recently to some popular misconceptions of bowel function. The colon has attracted the attention of both the patient and medical advisor for some 2,000 years. "Pliny (quoting again), A. D. 77, tells how the Egyptians learned to wash out their bowels from observing the habits of the ibis; 'he (the ibis) washes the inside of his body by introducing water with his beak into the channel by which our health demands that the residue of our food should leave.' It is cruel to deprive the ibis of his claim to this epoch-making discovery, but the truth must be told; the ibis does not give himself a Plombières douche, but after washing his beak in water he oils it in his preen-gland, which is situated near the anus, in preparation for preening his feathers." Hurst goes on in the same humorous vein showing the popular attention directed towards the colon, frequently revived, at times even being a religious function. It is stated that Louis XIV received several thousand intestinal douches during his lifetime.

Various "fads and fancies" have appeared even in modern medicine. Over nine-tenths of the patients with gastrointestinal symptoms, many of whom are in states of semi-invalidism, have so-called functional disturbances of the gastrointestinal tract, the colon most often being the offender. A large percentage of these troubles are due to either gross ignorance of normal hygiene or very frequently to improper directions by the medical adviser. Either physicians have not acquainted themselves with normal physiological function or simply do not take pains to investigate their cases properly. The best evidence of this is the fact that stool examinations are comparatively rare in the

*Presidential Address read before the Minnesota Pathological Society, May 19, 1925.

average hospital and also little that is trustworthy is written on the subject in the common textbooks of medicine. Very few of the systems of medicine even pay more than passing notice to the subject.

Shortly after I started the practice of medicine some "functional" gastrointestinal patients came to me for examination. I tried to take care of them according to the usual methods as described in the literature and taught at that time. I found that many of the patients drifted into various fads with indifferent results. Christian Science seemed to help more of them than anything else, and with my present knowledge of these cases the reason is obvious. During the last ten years or more these cases have not been dismissed as neurasthenic, but have been given a careful study. In each case a careful history and examination has been made. Something over 1,000 colons have been studied by roentgen ray and a large percentage of these have had repeated stool examinations and complete gastrointestinal studies. My interest in the subject has been intensified because of the popularity of various diets, many of which are pure fads; the unsatisfactory results of various surgical procedures; the long list of new cathartics and other laxative measures; and more recently the revival, especially in the East and in Europe, of colonic irrigations.

In presenting the subject I have no pathological material to show, for obvious reasons, but it seems to me that we can legitimately discuss abnormal physiological function in a pathological society. I have been able to discover but little pathological study of the colon except by gross methods, and in time, as technic improves, it is not unlikely that definite morphological changes will be demonstrated in some of the more chronic cases.

In order to understand abnormal function we shall briefly review the main points of anatomy and physiology. We cannot separate colonic function from that of the entire gastrointestinal tract, but we shall develop our subject by focusing primarily upon the colon.

Anatomical Considerations.—The colon develops in the embryo from the hind-gut, which at first is a straight tube lying more to the left side of the body. The anlage of the cecum at first lies in the upper part of the left abdomen and by a process of rotation and twisting reaches first the right upper abdomen and finally the lower right quadrant. This migration carries the peritoneum, mesentery and blood vessels with it. The process may be

interrupted at any stage or it may go astray so that part or all of the colon may be transposed. These facts are of importance for two reasons: (1) Various so-called kinks and bands or membranes may appear; (2) parts of the colon may be either unusually shortened or show unusual loops. This explains part of the great variability of the normal colon. The anal canal below the level of the internal sphincter is derived from the fetal cloaca and is lined with modified ectoderm or skin.

In the average normal adult the colon is about 1.5 meters in length and equals about one-fifth the entire gastrointestinal tract. The length, however, greatly varies; the short, heavy individual is more likely to have a shorter colon than the asthenic type; but exceptions are common. The mobility of the colon also shows great variation; it may lie anywhere in the abdomen except as controlled by several more or less fixed points. The cecum is ordinarily free, but shows great variation. The ascending colon, the hepatic flexure, splenic flexure, and pelvic colon are comparatively fixed.

These flexures are sometimes considered as places of true anatomical obstruction because of misinterpretation of x-ray shadows which can be read only from one plane. There is normally a delay of the clyster at the junction of the sigmoid and iliac colon and also at the splenic flexure.

Normally, the colon is largest and has the thinnest wall over the cecum and ascending colon. There is a gradual but slight decrease in calibre from this region until the ampulla recti is reached.

The colonic wall is made up of an inner mucosa and submucosa, a middle circular nonstriated muscular coat and a very thin outer longitudinal muscular coat the fibres of which are grouped into three longitudinal bands, one in front and two laterally. These bands continue as far as the ampulla recti, where the anterior band ends and the other two form a heavy longitudinal coat. The longitudinal muscle bands are shorter than the colon and cause numerous sacculations. The circular fibres are heavy at the rectosigmoidal junction (O'Beirne's sphincter?).

The peritoneum completely surrounds the movable part of the colon except at the mesenteric attachment. At fixed points the colon lies retroperitoneally. In the rectum the intestinal muscle becomes greatly thickened at the lower end, where it forms the internal anal sphincter. The external sphincter and the anal channel are embryologically

differently derived. The lining here is modified skin and the muscular coat striated muscle. The proximal colon is guarded by the ileocecal valve, which consists of folds derived by an invagination of the ileum into the colon. Opposite this valve there is present a constriction of the colonic wall. This valve is usually competent, but there is great variation in apparently normal individuals.

The anatomy of the blood supply is of little importance except that it is less in the distal portion of the colon than in the proximal colon, and the terminal vessels have poorer collateral circulation. The rectum, on the other hand, has a very abundant blood supply.

Efferent nerves of the colon are supplied by the thoracolumbar (sympathetic nerves) and the craniosacral (parasympathetic) divisions of the autonomic nervous system. Fibres from both divisions go to Auerbach's plexus lying between the circular and longitudinal muscles and to Meisner's plexus lying in the submucosa. This latter plexus is much smaller than Auerbach's plexus, probably because it does not control motor impulses. Afferent impulses pass by the visceral reflex arc through the cerebrospinal axis. The mucous membrane of the colon, according to Hurst,² has very few sensory fibres as compared with skin or other sensory organs. The whole gastrointestinal nervous system is greatly influenced by its connection with cerebrospinal system.

The neuromuscular apparatus of the intestinal tract is imperfectly understood. There is a gradual anatomical transition of nerve to muscle. Keith³ has suggested that there is an intermediate tissue between non-striated muscle on the one hand and sympathetic nervous tissue on the other; and he has called attention to the embryological relationship. It was while studying cardiac muscle with Flack that he decided to study intestinal muscle because he thought this more primitive tissue might show a connection between nerve and muscle. He first studied rats and found a ganglionic collar near the ileocecal junction which was intermediate between the elements of Auerbach's plexus and the non-striated muscle cells. This tissue closely resembled the nodal areas of the heart. He believed that in rats at least this area was a source of nervous impulses. A "preliminary survey" showed similar nodal tissue at the distal transverse colon and in the lower descending colon. Nodal tissue

was scarce in the appendix, cecum and ascending colon. He suggested that this nodal tissue may have functions similar to those in the myocardium.

The rectum has a similar motor nervous supply. The anal canal has cutaneous sensation. The sensory nerves of the anal region are closely connected with that of the neck of the bladder and urethra, the vagina in the female, and prostate in the male.



Fig. 1. Normal formed stool.

Pain from this region may be referred to the hip joint or inner side of the knee because of nervous connections with the obturator nerve. The rectum also lies upon the sacral plexus, which may be stimulated by pressure.

The mucous membrane of the colon is pale, smooth and has circular semilunar folds at the dividing line between the sacculations. No villi are present. Numerous follicles and crypts of Lieberkühn are present. Solitary glands are few and are more numerous in the cecum.

Physiology.—The gastrointestinal canal is a tube of striated muscle consisting of two layers, an internal circular and an outer longitudinal. This tube is modified according to physiological requirements, but the fundamental properties of non-striated muscle form the basis of its function:

1. Non-striated muscle contracts more sluggishly than striated muscle. The rate of contraction is slow, the refractory period long and after frequent stimulation it may pass into long periods of fatigue. After prolonged rest it seems to become hyper-irritable and responds to slight stimuli by powerful contraction. (Related to massive peristaltic movements.)
2. There is transmission of stimuli from fibre to fibre in smooth muscle.

3. Smooth muscle can maintain a lasting contraction without fatigue (shells of bivalves). (This may explain spastic conditions of the colon.)
4. "Muscle tonus is fundamental" (Cannon), but it may be influenced by extrinsic factors.
5. Smooth muscle in hollow organs responds to tension by contraction.
6. Shortening of muscle is caused by direct irritation.
7. Tendency to rhythmic contraction is a primary function.

These fundamental properties may show changes in degree because of physiological and anatomical requirements.

The smooth muscle of the intestinal tract has been adapted for various functions. Alvarez⁴ has brought evidence to show that "denervated muscle" strips from various parts of the gastrointestinal tube behave physiologically very differently. Upon these findings he has advanced his "gradient" theory. The rate of rhythmic contractions in the duodenum is twenty per minute, lower ileum ten per minute, but an excised segment from the colon is "slow to start beating; its rate is slow; it tends to contract down into a hard knot and stay that way, and the gradient is poor and often reversed." In the small intestine Alvarez believes the "rate of rhythmic contraction continues to vary inversely as the distance from the pylorus." Besides gradients of rhythm the same author believes there are gradients of tonus, of irritability as shown by response to stimuli, and of anatomical structure of the muscular and vascular supply of the gastrointestinal tube. He likens the response of any part of the gastrointestinal tract to stimuli, to ripples from a stone thrown in a flowing stream of water. Ripples extend in all directions, but reach a much shorter distance up stream because of a downward "gradient," the current.

This leads up to the question of what is the mechanism of normal peristaltic movements.

The "law of the intestine" of Bayliss and Starling,⁵ or the "myenteric reflex" of Cannon,⁶ as well as the studies of Meltzer⁷ ("law of contrary enervation") have attempted to explain the phenomena observed. The regulation of peristalsis is believed to be under the control of Auerbach's plexus lying between the muscular coats. This reflex consists

in the production of a relaxation, with inhibition of movements, below the area of bowel distended either by a mass of food or an inflated bag. Above the area there is an increase of tone, with powerful contractions, which moves the content onward. This effect can be prevented by stimulation of the splanchnics and increased by vagal stimulation, according to Bayliss and Starling and others.

Alvarez attempts to disprove this law by various experiments. He believes that the simpler gradient idea is sufficient to explain the onward course of the bowel content. He does not minimize the importance of the myenteric plexus and the influence of the central nervous system, but does believe that peristalsis is autonomic and an inherent property of intestinal non-striated muscle. The gradient theory surely fits in with clinical observations and makes abnormal physiological phenomena more easily explained. Alvarez believes that normally ripples of waves from one or more pacemakers in the stomach or duodenum pass through the entire intestinal tract including the

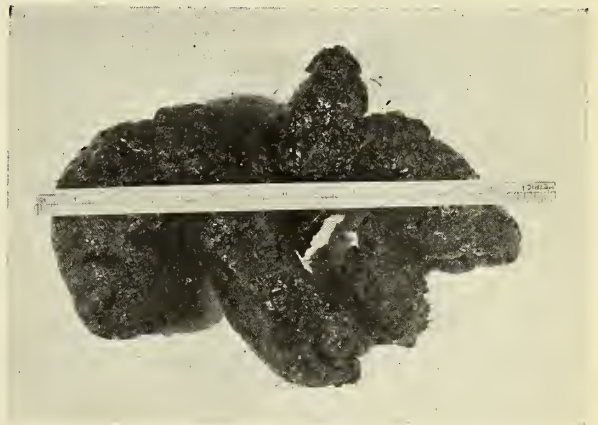


Fig. 2. Soft formed stool. Normal stool on coarse diet.

colon. The response to the stimulus depends upon the intensity of the stimuli and to the inherent physiological properties of the segment concerned and its state of irritability, tonus, etc., at the time the stimulus arrives; he shows tracings which can surely be so interpreted. Alvarez claims that the myenteric reflex is difficult to demonstrate and seems to occur only with maximum stimulation of the gut. He states that in over 2,000 experiments the usual effect below an area of bowel distended by the usual normal content is not relaxation, but contraction which affords a very important safe-

guard against too rapid emptying. (Thereby differing from Bayliss and Starling.)

Auerbach's plexus probably co-ordinates movements both those reflex and those furnished by the central nervous system, but Alvarez believes the rush waves in the bowel are too slow if the impulses of each segment traveled only by nerve instead of muscle fibre to muscle fibre. At least the major part of stimulation is due to muscle transmission. Auerbach's plexus shows much larger cells and fibres than the submucosal Meissner's plexus. This latter seems to control glands of the mucous membrane and receive stimuli from the mucous membrane, transmitting them to the motor Auerbach's plexus. In brief these plexuses are regulatory mechanisms which "expedite conduction."

The anatomist Keith as stated before has shown some node-like cells in various parts of the gastrointestinal tube and has advanced the idea that the intestinal tract is regulated by several pace-makers which when functioning abnormally produce irregularities and disturbances similar to that observed in disturbed conduction in the heart. He has not proven his hypothesis although the anatomical evidence of areas of "nodal tissue" is considerable.

The extrinsic nerves have profound influence upon gastrointestinal function as shown by Cannon and others. Eppinger's⁸ idea of explaining nearly all functional disturbances by lack of balance between the vagus and sympathetic systems is not tenable either experimentally or clinically. Increased vagus action, however, has a tendency to increase tonicity and peristalsis, and secretions, while sympathetic stimulation has the opposite effect. The vagus, instead of being a purely excitatory, and the sympathetic an inhibitory, are both probably mixed, and the effect of stimulation or inhibition is variable. The recent work of Hatcher⁹ upon the vomiting reflex would strengthen this opinion. Division of the extrinsic nerves is followed by recovery of intestinal function, in much the same way as the heart has been shown to recover.

Let us now discuss some of the functions peculiar to the colon. It is guarded at the proximal end by the ileocecal valve, which consists of sensitive muscle fibres, as well as the increased density of the nervous plexus. It probably controls more or less imperfectly the passage of food into the colon and

the regurgitation of colonic contents. An ileo-pyloric reflex mechanism has been suggested but not proven (Barclay¹⁰). The fluid content of the ileum is admitted into the cecum and ascending colon, which are essentially an organ of absorption, especially for water. No digestion takes place except when incomplete in the small intestine or when due to bacterial action. There is probably very little absorption of food material. This proximal colon is much larger and thinner walled than the distal colon. In the distal third of the transverse colon and up to the rectosigmoidal junction we have essentially an organ of storage and elimination.

The motor mechanism of the colon has afforded a great deal of discussion, but there are essentially two main types of movement.

1. Cannon⁶ believes the prevailing movements of the proximal colon are antiperistaltic, consisting

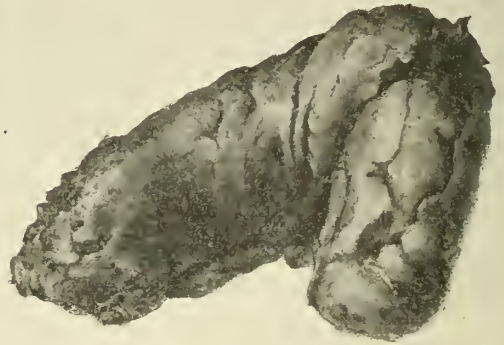


Fig. 3. Large constipated stool.

of a series of waves perhaps at the rate of five a minute for four or five minutes and at intervals of several minutes or more. Case¹¹ has confirmed his observations. The antiperistalsis may very often, however, be only apparent and due to back pressure from localized contraction of short segments farther on with displacement of content in either direction.

2. Mass movements, as first described by Holzknecht,¹² begin usually in the distal half of the colon with disappearance of haustral markings and the formation of a sausage-like bowel and a deep forceful contraction wave. This movement is rarely seen except when taking food or upon arising in the morning. I have seen it a few times after

giving a barium clyster. Normally there is probably a gastro-colic reflex.

Haustral churning in the distal colon may be observed either in animals opened under saline solution or in man after a clyster. It is probably of little physiological importance. Rieder has described "pendulum" movements especially in the



Fig. 4. Small spastic stool.



Fig. 5. Spastic "baled hay" stool.

transverse colon due to twisting and gross movements of the bowel. This is again of little importance and probably has often been confused with the normal mobility of the free parts of the colon, which are always changing position with respiratory movements and from pressure of the small bowel and other organs. By far the most important are the mass movements occurring only at rare intervals, four or five times a day or less.

"After all of the soluble material and most of the water have been absorbed from the intestinal contents, they are carried from the cecum and ascending colon by the mass peristalsis to the pelvic colon, where they remain until the first peristaltic wave of the following morning occurs either as a result of the stimulus of getting up and dressing or of breakfast. They are then carried into the previously empty rectum, where they give rise to the desire to defecate, which is followed by the normal reflex process of defecation. Consequently during the greater part of the day the cecum, ascending colon and pelvic colon are more or less full but the rest of the colon is generally empty." (Hurst, 1922.¹)

Normally in the colon we have then certain delays:

1. At some point in the transverse colon, leading to filling of the cecum and ascending colon.
2. Recto-sigmoidal junction, leading to accumulation in the pelvic colon.

3. Above the anal canal, leading to accumulation in the rectum. This last is normally under voluntary control, but rectal muscle sensation may become impaired or the accessory muscles of defecation defective and as a result abnormal accumulation in the rectum may occur.

Sensations from the colon are normally few except the stimulus for defecation. Hurst² has carefully studied the sensation of the colon, the summary of which is as follows:

1. The mucous membrane of the colon to the anal canal is insensitive to tactile and thermal sensations, or to irritants.

2. The sensation of fullness in the alimentary canal is due to a slow increase in tension exerted on the fibres of its muscular coat; the adequate tension is constant for each segment, but the volume of contents necessary to produce this tension varies with the tone of the muscle fibres. The sensation of fullness in the rectum causes a call for defecation.

3. "*The only immediate cause of true visceral pain is tension*; this is exerted on the muscular coat of hollow organs. * * * Pain in diseases of the alimentary canal is most frequently true visceral pain; it is sometimes due to spread of the disease to surrounding sensitive structures or to tension exerted on the peritoneal connections; and, lastly, it may be situated in the skin, muscles, and connective tissues, to which it is referred from the segment of the central nervous system, which receives the afferent nerves from the affected organ." (Hurst.)

4. Tenderness may be reflex, with segmental distribution, or may be increased by external pressure whenever it increases the tension in the organ.

It may also be due to spreading of disease to the parietal peritoneum.

5. Visceral sensibility may be increased when there is an irritable condition of the central nervous system.

Clinical Considerations.—Any of the normal physiological phenomena may be altered by either functional disturbances or by disease, and the complaints of the individual be due to disturbed motility or sensation. By far the most common cause of abnormal function is due to changes of stimuli from the central nervous system, especially if the patient or physician misinterprets the symptoms, and tries to bring about relief without taking into due consideration the abnormal physiological process in hand. "Functional" colonic disturbances produce several groups of symptoms:

1. Those due directly to the action of the colon.
2. Reflex symptoms affecting other parts of the digestive tract or other organs.
3. Symptoms, although colonic, are associated along with disturbance of the entire gastrointestinal tract. (Toxemias, central nervous system disturbances, etc.)
4. Reflex vasomotor symptoms or symptoms of "so-called" auto-intoxication.

The more common symptoms referable directly to colonic function are as follows:

1. Disturbances of motility, especially those of constipation or diarrhea. This will be discussed later.

2. Loss of weight, in some cases due to the interference with absorption.

3. Disturbances of visceral sensation. Sense of pressure or fullness, pain and tenderness are the more common sensations of which the patient complains. The pain from an irritable colon may be directly over the fixed parts of the colon or may be referred to the lower abdomen below the navel, especially when originating from disturbed function of the transverse colon or other mobile segments. The pain is often related to the taking of food or to defecation, and is increased by irritable foods or active catharsis. Chilling of the body or ice cold foods often increase the distress; application of heat to the abdomen, the drinking of hot water or the taking of, a warm enema gives relief. The pain has a tendency to shift from place to place and is characterized by its inconstancy of intensity, duration, position and relation to food. Very often the distress is most at night when the

colon is most heavily loaded, or after some unusual nervous strain or shock. At times severe colic may occur but is different from the usual organic lesion colic, in being relieved by large doses of antispasmodics.

Reflex symptoms are many. The belching of gas, nausea, vomiting, anorexia, epigastric pain, and other disturbances of the stomach are common.



Fig. 6. Small loosely formed stool. Fermentative, containing starch and gas bubbles. Strongly acid.

There may be definite disturbances of motility and secretion. A full rectum interferes with emptying of the stomach, and enemas have been known to cause reflex vomiting. Alvarez states that the gradient may be made steeper and increase action, or be flattened out with a slowing up of function. Reflex cardiac symptoms such as tachycardia often occur. Frequent urination and other symptoms of vesical irritability are frequently associated with colon irritability. A reflex pyloric spasm or a cardiospasm is a common symptom of colonic disease. Colonic symptoms are often associated with symptoms produced in other viscera, all of which have a common etiology.

Toxemias, chronic infections, general vagotonic and sympathotonic states (both of which are primarily rare), and many other conditions seem to spend their force upon non-striated muscle and cause a multitude of symptoms. It is not uncommon to find cardiospasm, pyloric spasm, hyperperistalsis of the stomach, hypertonic conditions of the colon, and anal sphincter spasm in the same individual; or less often atonic states. More frequently there is a mixture of hypertonicity and

atonicity in various segments of the gastrointestinal tract. The same stimulus or absence of stimulus does not always produce the same effect in the various segments.

The theories¹³ concerning *autointoxication* are too numerous to even enumerate, and impossible to intelligently review. Very little reliable scientific evidence is at hand, except on the negative side. The body has a remarkable resistance against absorption through the mucous membrane of noxious substances produced by digestion or bacterial action; and also the secondary defenses are extremely effective. The results of surgical treatment furnish little but negative evidence. Christian Science and other cults are at present many strides ahead of colonic resection and short-circuiting operations if the results of the treatment can be interpreted by relief of symptoms. On the other hand, it can conservatively be said from clinical evidence that absorption of toxic substances or some other disturbance of the chemical or physical process of digestion and absorption may produce symptoms or even disease, but probably on the whole this theory of autointoxication has been overstressed both by patient and physician until the fear of constipation has become a phobia to both. It has been shown that many of the symptoms of autointoxication can be produced reflexly by experimental distension of the distal colon or rectum and can be almost instantaneously relieved by release of the tension. The experimental evidence at hand suggests that both factors, those of abnormal absorption and those of abnormal motor activity, may separately or together produce the general symptoms known as "autointoxication." These general symptoms are familiar to every one. The nervous depression and lack of power for prolonged mental effort; the sallow muddy complexion; the cold extremities, subnormal temperature, and tendency to other circulatory disturbances; the muscular, nerve and joint pains; the headache and vertigo; the impairment of nutrition; and hosts of other symptoms characterized by their variability may occur in the general symptom complex.

Very frequently the patients with abnormal colonic function are the victims of cathartic or enema habits, or of various dietary fads; and the symptoms are produced by the treatment. I would agree with Hurst when he says: "Purgatives often cause abdominal pain, intestinal stasis rarely. Bacterial decomposition is very active and an excess of toxins

is produced and absorbed in the colon when its contents are kept fluid by the use of purgatives, but the reverse is the case in the semi-solid or solid contents of the colon in intestinal stasis."

The history and symptoms of these patients are sufficient to suspect an irritable colon; but a physical examination, an examination of the stools, the roentgen examination and finally the therapeutic test may be necessary to thoroughly understand the case under observation. There is no sharp dividing line between normal physiological variations on the one hand and definite colonic pathology such as an ulcerative colitis on the other; the irritable colon may develop ulceration. Some of the colons have been shown to be thickened or have areas of degeneration or fibrosis, as demonstrated by Keith³ in colons removed for intestinal stasis.

The function of the colon from a practical standpoint depends upon the balance between two forces at work: (1) The force of onward peristalsis and (2) the resistance to that force. Often the tendency to hypertonicity or spasm of the circular

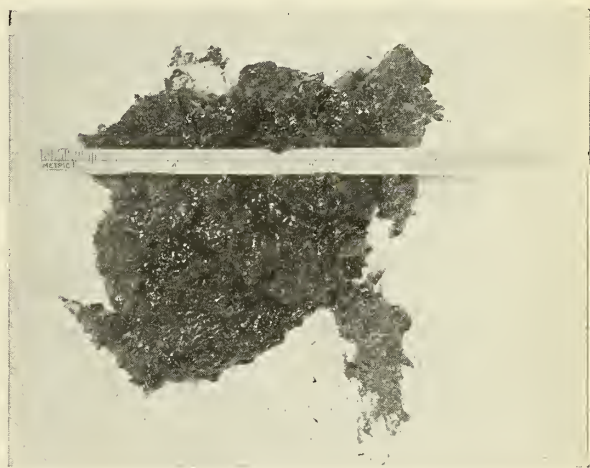


Fig. 7. Mushy stool, non-fermentative.

muscle must be compensated by an increase of peristalsis. A normal optimum balance between these forces exists. The normal for the different individuals may be different, due to inherited anatomical and physiological characteristics, or to acquired factors extrinsic to the bowel. With such great variations of the normal we should be very careful in the interpretation of our findings and symptoms.

Examinations of the Stools.—The typical normal stool is cylindrical in shape, about one inch in diameter and about the consistency of putty. Some

variation exists in consistency due to diet and fluid content. The color varies with the bile content and the diet. The normal individual usually has one normal stool per day and at the most two. The odor is mild and not especially unpleasant. The normal stool weighs about 200 grams, is 75 per cent water and 25 per cent solids. It is faintly alkaline, neutral or less commonly faintly acid in reaction. The bulk of the solids is made up of dead bacteria and dried up secretions from the digestive tract. Grossly no mucus nor undigested food particles should be observed. The normal stool usually sinks in water. By microscopic examination the normal should show little or no undigested starch cells. Connective and elastic tissue, and meat fibres devoid of striations and nuclei are sometimes present. Soaps and occasionally soap crystals may be present, but rarely free fat nor fatty acid crystals. There may be a large amount of vegetable residue. Crystals of ammonium magnesium phosphate or triple phosphates, calcium phosphate and calcium oxalate may be present. A stool which in its latter part is soft should never be considered as a constipated stool, because it must come from high in the colon.

The abnormal stool may be mushy or liquid; spastic, in small balls or pencil-like; spastic but compressed into a mass in the rectum (the "baled hay" stool); or a truly constipated stool. Except for the constipated stool the other types indicate an *overactive bowel with one or the other element most active*. The truly constipated stool is one similar to the normal, but larger in calibre and dryer. It is not associated with colonic symptoms and gives little trouble except irritation in the rectum and possibly hemorrhoids, or occasionally reflex symptoms. Mucus which can be seen by inspection commonly coats spastic stools. Mucus intimately mixed into the stool indicates extreme irritation. Leucocytes and blood do not appear except in definite ulcerative lesions.

In excessive fermentation of carbohydrates the stools are spongy or liquid, very strongly acid with a sour odor, very irritating and usually contain so much gas that they float upon water. Microscopic examination shows undigested starch. One point should be remembered in differential diagnosis: A normal individual during a diarrhea after a cathartic may have an acid stool containing undigested starch, but usually clostridia such as are found in carbohydrate fermentation are not com-

mon. Putrefactive stools in my experience are uncommon and when they appear are strongly alkaline in reaction and have a hydrogen sulphide odor. Repeated examinations of the stools must be made to find the average for the patient being studied, because the normal varies considerably with diet, exercise, and nervous strain.

The roentgen examination is only an aid in the interpretation. It gives information about the general habitus of the individual and his reactions to both a barium meal and the opaque clyster. The barium meal is well along in the colon in the average normal individual at the end of thirty-six to forty-eight hours and should be evacuated in forty-eight to seventy-two hours. The position of the meal at various intervals is so dependent upon the

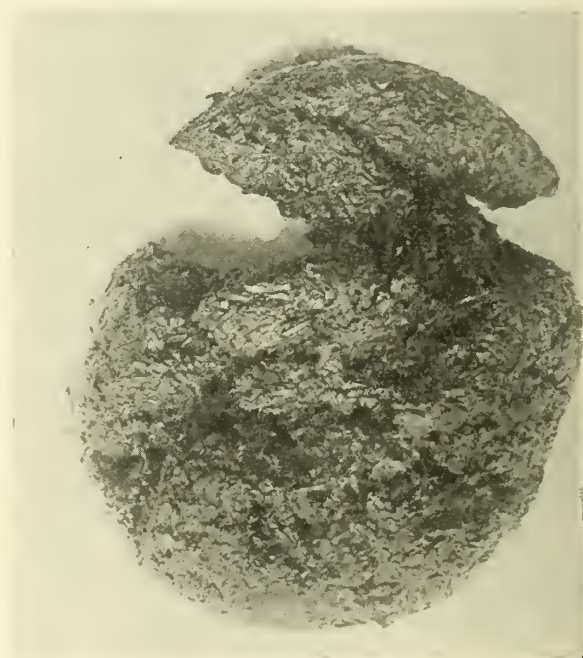


Fig. 8. Chronic dyspepsia and pain. Note bran and fibre. (Normal individual who took "roughage" to prevent trouble.)

patient's idiosyncrasies that interpretation must be guarded. The effect of diet, time of bowel movements, exercise, and mental impressions greatly influence the motility. Very much more important is the way in which the bowel handles the meal when viewed under the fluoroscope as related to points of tenderness and pain. Films furnish some details which cannot be seen under the screen.

The colon shows various degrees of motility, dilatation and spasm, and the presence or absence of normal haustration. Filling defects are due to

organic disease, which is beyond this discussion. Congenital abnormalities such as position and unusual looping can be recognized. Personally I have not seen sharp kinks in the colon sufficient to produce the slightest obstruction except in definite organic disease. A thorough search for other organic abdominal disease must be made, because colonic disturbances may be secondary to peptic ulcer, achylia gastrica, carcinoma, gallbladder disease, pelvic disease, appendicitis, etc.

The opaque clyster is usually taken rather slowly by the normal individual. Slight delays are noted at the rectosigmoidal junction, where the pelvic colon crosses the left iliac fossa, or at the splenic flexure. Pain and distress are not severe and very little contraction of the colon can be seen. The capacity of the colon is usually 1,000 to 1,500 c.c., and with a gravity pressure of 1.5 to 2 feet the ileocecal valve is rarely or slightly incompetent. In many irritable colons, even in the absence of clinical ulceration, the clyster may be taken very rapidly; and haustration may be greatly decreased or absent in the distal colon, and the bowel extremely irritable, even to the point of extreme localized spasm or massive peristaltic movements—in such cases the pain may be severe. The amount of ileocecal incompetence is usually directly proportional to the amount of dilatation of the cecum and ascending colon. Proximal colon dilation is most frequently associated with hypertonic conditions of the distal colon (the dyskinetic constipation of the Germans¹⁴). Much more rarely there is a general colonic dilation; such a condition is best typified in the megalocolon of Hirschsprung.

The popular medical conception that the barium meal must be evacuated in two or three days has caused much meddlesome therapy. It was long ago recognized that the patients with large atonic colons could go days or even weeks without stools and still be in good health. The symptoms were none or only a sensation of weight and distension.

Recently Alvarez and Freedlander¹⁵ stated that barium is no index of the rate at which food leaves the body—it is only comparative as far as the drug is concerned. I have not uncommonly seen barium act as a cathartic and cause a diarrhea, while in others impaction has occurred. The above authors fed normal medical students small glass beads with a regular diet. Most of the subjects required four days in which to get rid of 75 per cent of the beads, some passed only 50 to 60 per cent in nine

days. The writers conclude that the colon may normally contain residue for one week. They also state, "When the end portion of a formed stool is quite soft, we can say, with a considerable degree of confidence, that the colon has emptied itself as far back as the ascending colon, and we need then have no fear of a marked intestinal stasis." They also agree with Burnett that "men with slow rates and well formed, well digested stools should have good health, and those with the fast rates and voluminous, mushy, badly digested and frothy stools should have poor nutrition, flatulence and indigestion." This has been my clinical observation for several years; but I also believe the chronically spastic stool is the most common in chronic colonic disturbances.

Let us next discuss "intestinal stasis and constipation," terms which have been loosely applied to all sorts of disturbances. The word "constipation" should be reserved for the truly large formed dry stool and may occur in two conditions:

1. Atony of the colon. This is very uncommon and is best seen in megalocolon, or following enema habit.

2. Rectal dilatation due to a decreased defecation reflex. The stool in this latter condition is very often large, but may be made up of small balls compressed into a mass forming a "baled hay" type of stool, indicating a spastic colon above the rectum. This condition may occur where there is anal sphincter spasm from any cause. This type of constipation, called dyschezia by Hurst, may occur either in a normal or in various spastic conditions of the colon. Atonic constipation is very rare, dyschezia relatively common; the latter is the most common type of constipation in my experience in the man who earns his living by outdoor muscular effort. The symptoms are comparatively few other than rectal and reflex.

Of chief interest, however, is that largest group of patients who have spastic conditions of the bowel which they believe and very frequently make the physician believe are constipation. They complain of the various colonic reflex and general symptoms described above, upon which the symptoms of irritation from cathartics, enemas, and dietary fads are superimposed. The stools may be spastic, "baled hay" type, or liquid, or there may be alternation of diarrhea and spastic stools, all depending upon the balance between longitudinal peristalsis and tonic resistance. For short periods

when patients are well the stools may be normal. For descriptive purposes we shall, more or less arbitrarily, describe certain clinical types.

Group I. There is the neurotic individual who has some indefinite chronic dyspepsia which is associated with what he calls "gas on the bowels" and irregularity of stools. He may watch his stools and see remnants of food which were eaten two or three days before, which is interpreted as abnormal. Since the stools are not normal and since he does not have the sensation of satisfaction after defecation, he takes a laxative or enema to relieve some of the discomfort. On the following day and on the next he may have no stool or, he thinks, an insufficient stool, and as a result draws the conclusion that he has constipation. In the future he "does not allow" himself to go without "proper movement" of the bowels, develops a vicious cycle and in time has increased spasm of the descending colon which nature tries to remedy by increasing peristalsis, but often fails. Dilatation of the proximal colon may appear, very often marked incompetency of the ileocecal valve, and all the symptoms of dysfunction.

Upon examination the patient may be undernourished and gives the impression of general ill-health. The physical signs are nothing much more than a tender ropy colon especially in left lower abdomen, and sometimes a large gurgling cecum. Rectal examination shows no fecal matter in the rectum. These patients become greatly depressed and over-react both to cerebral stimuli or to disagreeable impulses from their digestive tract. The patient consults a physician and is often discharged as a "neurasthenic" without an investigation of either his diet or habits. Frequently magnesia, cascara, mineral oil or bran is prescribed for various symptoms, or he is treated for mistaken organic conditions, such as a gastric ulcer, because of a reflex pyloric spasm. Exploratory laparotomies may be done, gallbladders and appendices removed, all without permanent help to the patient. The x-ray examination may or may not disclose delay in motility, but does disclose extreme irritability and very often a dilated proximal colon. Although, as Rost¹⁶ has shown, there may be muscular hypertrophy and occasionally violent contractions of this dilated colon, it usually is not able to overcome the resistance of the spastic distal colon.

Group II. A somewhat similar condition may occur in normal individuals who have used too

coarse a diet or laxatives as a preventive measure, or in those with irregular dietary habits, such as imperfect mastication, irregular meals, etc. I have commonly seen this condition in business and professional men who are under strain and without sufficient rest and exercise.

Group III. The irritable colon may be secondary to organic conditions occurring in the abdomen especially when treated by magnesia or other laxative drugs. I wonder if a popular medical sign of gallbladder disease, consisting of tenderness and pain in the left lower abdomen, may not be due to the prolonged use of magnesia or saline cathartics. Many times I have treated the colon disturbance, with disappearance of all symptoms, because the gallbladder had in the meanwhile become quiescent. Appendicitis or pelvic disease may also cause an irritable colon. A few adhesions from the left tubal region to the pelvic colon may cause marked localized spasm.

Group IV. An irritable colon may be secondary to chronic infections and toxemia. Focal infection and chronic pulmonary tuberculosis frequently have gastrointestinal symptoms of which the colon is most important. It should not be confused with ulcerative colitis.

Group V. Vagotonic individuals are less common than some would lead us to believe. However, occasional individuals do seem to show signs of overstimulation of the cranio-sacral autonomic system, the colon being a part of the picture. These patients have a tendency to show spasm of the various sphincters, irregularities of secretion, and various circulatory disturbances.

Group VI. The irritable colon may persist following some acute enterocolitis, or on the other hand a gradually increasing irritability may cause a chronic diarrhea without any tendency to spastic stools. Such a condition may follow achylia gastrica.

Group VII. A somewhat different type of irritability may occur in cases of carbohydrate fermentation, in which the stools are typical of the condition. The etiology is uncertain, but it frequently occurs in patients who overeat of carbohydrates, especially starch, and where sufficient exercise is not taken to properly metabolize the excess. A. D. Schmidt and Strassburger¹⁷ suggest that some of these patients may have a congenital weakness in consuming carbohydrates, especially in splitting cellulose. The intestinal contents assisted by bac-

teria ferment in the large intestine, cause the formation of gas, often fluid or spongy stools, and extreme bowel irritability. These patients frequently complain of dizziness, headaches, flatulence, tachycardia, and various vague symptoms. Irritation about the anus is common, and sometimes these patients seem prone to pains in the extremities or even deforming arthritis. Dental caries and spongy gums in my experience may be one of the first symptoms of the disturbance. In some of the cases with large carbohydrate ingestion, the liver may be slightly enlarged, the skin have a yellowish sallow appearance, and bile pigments may be increased in the urine. Possibly there may be some functional liver insufficiency in these cases.

Group VIII. A condition associated with severe right abdominal pain must be discussed. This consists of cases who are usually fairly well, but who under nervous strain or other unrecognized causes have attacks of severe right lower abdominal colic, sometimes so severe they may faint or go into shock. Severe nausea and vomiting may follow. Sometimes before the onset of pain the patient describes a sensation of weight in the right lower abdomen, or, opposite to his usual sensations, feels as if all motility has stopped. He sometimes has discovered a "swelling" in the right lower abdomen; and following the attack of pain this "swelling" disappears and he passes copious stools, but tenderness persists for several days. Upon several occasions I have observed this cystic mass in the right lower abdomen and have had it firmly contract under my hand, at which time the patient complained of discomfort or pain. This was followed by gurgling and a disappearance of the tumor. This condition may or may not be associated with the secretory anomaly known as "mucous colitis," a term which does not really designate a clinical entity and is not a "colitis" at all, but an indication of an abnormal secretory function of the bowel associated with disturbances of motility. This condition as described is often confused with appendicitis.

Closely related to this same abnormality is that observed by T. S. Wilson¹⁸ as "rigid stiffening" of the cecum and ascending colon and by Philip Turner¹⁹ as "hardening," in which the bowel shows increased tone while the muscle fibres of the circular coat are in an extended condition. Wilson attempts to explain the phenomenon physiologically by Sherrington's theory of "postural activity" of

muscle fibres. It would seem, however, that the fundamental properties of smooth muscle could explain the condition more simply; the phenomenon being nothing more than variation of the irritable colon.

Group IX. Many cases of abnormal bowel function have certain symptoms absent and others intensified. Especially is this true in some cases of migraine, the headache being the only severe symptom.

Group X. Congenital defects, folds and bands predispose patients to irritable colon, but should not be considered as etiological.

Time will not permit, even if I had the information, to discuss the secretory, chemical and bacterial factors concerned in the subject. I myself have not been able to grasp any workable conception of these phases either in the normal or pathological.

It may be said that some of the above symptoms, which have been discussed, should not be considered as due to functional but to definitely diseased states. None of these cases, however, show gross pathology; but perhaps more careful microscopic study along the lines described by Keith may disclose structural changes. Sigmoidoscopic examination shows nothing more than a granular appearance of the mucous membrane in some cases. There is no inflammatory exudate in the stools, except when ulceration is superimposed.

Treatment.—The management of these cases is comparatively simple when there is a thorough understanding of the individual patient at hand. Each individual should be studied from an etiological standpoint; abnormal hygiene and sociological or economic difficulties must be investigated and the patient instructed as to proper "background" for good health. He must have a healthy mental outlook upon his condition and the world in general. He should be taught something of the fundamental principles of normal gastrointestinal physiology, normal hygiene, and dietetics. Many of these patients come in with a complaint of constipation and when asked why they think that they are constipated they state that they do not have sufficient bowel movement either because of what they believe is an insufficient quantity of stool, or the sensation of relief is not present. It must be explained to them that normally food should stay in the digestive tract for two days or more and the sensation of fullness or absence of satisfaction

from stooling is not necessarily due to accumulation of fecal matter, but due to the muscular condition of the bowel. I frequently ask them: "If you had taken a dose of castor oil and had 4 or 5 stools, would you then interpret the sensation of wishing to have a farther defecation as meaning that something is in the bowel?" They naturally answer in the negative. They are also told how their treatment and mental attitude may increase the spasm and pain, and at the same time make their brain more susceptible to disagreeable sensations.

It is only by such psychotherapy, if you please to call it such (I prefer to call it education), that the patients will gain sufficient confidence to follow your instructions. The directions should be given in the minutest detail, in writing; and these patients should be shown what a normal stool should be and cautioned that a spastic stool may mean just as much or more irritation and overaction of the bowel as a liquid or mushy evacuation.

In either case all cathartics and irritating foods should be withdrawn. Instead of increasing peristalsis by giving foods with a great deal of refuse, the motility of the bowel, especially circular muscle spasm, should be decreased. This is done by giving food "concentrates." The universal prescription of coarse foods, bran and mineral oil should not be given in bowel conditions where there is increased irritability. In my experience atonic conditions of the bowel, associated with slowing of peristalsis, is very rare, although the general impression among physicians and patients is just the opposite. A coarse diet should be prescribed only in these atonic cases and only as it is consistent with having normal stools without abdominal pain or discomfort. Large quantities of bran and coarse foods, cathartics and other therapeutic agents may temporarily give the spastic cases relief by keeping the bowel empty and thereby preventing muscular tension or possible absorption of toxins; but the irritability and spasm are increased by the treatment and a vicious cycle is established. In many of these cases the distal colon is so contracted that a normal content will cause tension and disturb sensation; on the other hand the larger and weaker proximal colon attempts to compensate for the functional obstruction in the lower colon, fails in the effort and secondarily becomes atonic, dilates and allows regurgitation through the ileocecal valve into the ileum.

In order to relieve the spasm I have used antispasmodics such as belladonna, and in most cases have used calcium salts. The late Dr. Sippy used calcium salts almost routinely in the colon cases with diarrhea, especially prescribing the purest calcium carbonate and phosphate. The effect of calcium salts is probably threefold:

1. It has a mild alkaline reaction and inhibits growth of organisms growing upon fermenting carbohydrates (i.e., in acid medium).
2. It gives bulk to the stools, furnishing sufficient calcium salts, which are required for stool formation.
3. The calcium ion may possibly relieve some of the spasm; this later effect, however, is difficult to demonstrate.

Upon this treatment, which is similar to that employed in acute diarrheas, a chronically irritable colon gradually improves. Loose, mushy or liquid stools again begin to assume form and in spastic cases the stools increase in size. Not uncommonly on such a regime the relaxation obtained in the distal colon allows the abnormal peristalsis to force out stools before the water has been absorbed. In other words a case of so-called spastic constipation passes through a stage of diarrhea before the stools begin to become normally formed.

For temporary relief, when the patients have not stooled we are in the habit of injecting into the rectum a very small quantity of olive or cottonseed oil and have them retain it over night. Sometimes this may be followed on the next day by the injection of a very small quantity of warm water, the maximum being a half pint. We of late have not found it very often necessary to use any of the mineral oils or combinations of mineral oil and agar.

Each case must be treated individually, depending upon the indications, the details of which are beyond the scope of this discussion. The return to the more bulky foods is directed by the condition of the stools and symptoms of the patient. Some individuals have a tendency to a recurrence of symptoms when upon nervous strain or return to coarse foods.

I believe that much of the publicity given to certain dietary fads and to encouraging the use of bran and other coarse foods is distinctly harmful to the public and is causing a great deal of semi-invalidism.

There are a few points of scientific interest which suggest themselves to me for farther investigation. A microscopic pathological study should be made more commonly of tissues from the intestinal tract, either that removed from operations or that from *fresh* autopsies. The question of mineral metabolism is also extremely interesting. In animals, at least, the use of magnesium salts or anything which whips up peristalsis and shortens the time which food stays within the tract may cause withdrawal of calcium salts from the body and even definite bone pathology.^{20,21} The effect of calcium administration in these cases of irritable colon associated with the cathartic habit may possibly be supplying a calcium deficiency.

"The milk cure" has long been used by osteopaths and some irregular institutions for these conditions; possibly the large calcium content as well as bacterial flora bring about the good results sometimes obtained. Coarse vegetables, I believe, contain a ratio of calcium to magnesium of 1:1, while in the body the ratio is somewhere near 4 to 5:1; this must also be taken into consideration, after prolonged use of vegetable diets.

In fermentative conditions associated with formation of organic acids the calcium content of the bowel may possibly also be used for a neutralization of acids.

These are only a few of the problems which have been suggested by my study. In conclusion it may be stated that atonic constipation, a term which should be reserved for a sluggish acting bowel not associated with hypertonicity, is a rare condition in the physician's office and usually does not produce symptoms other than those of distension and pressure. Rectal constipation or dyschezia is more common than atonic colonic constipation, but these patients also are comparatively free from symptoms except those of a reflex nature and those due to hemorrhoids or other trouble in the rectum; this condition is a purely hygienic one except in some organic nervous diseases. The majority of patients who do consult the physician and are truly uncomfortable or ill, are of the irritable bowel type. They are not always neurasthenics, but should be carefully studied and advised. More harm is frequently being done by so-called "corrective measures" employed either by the patient or medical advisor than is produced by the original condition for which the patient has been treated.

I would also appeal to more interest in pre-

pathological conditions. The clinician, and the pathologist as well, has been more interested in structural damage of tissue, rather than the body as a living machine and the patient as a human being.

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Surgeon General Cumming says that the cross scarification method of vaccination, which was formerly common and which is still adhered to by some, is dangerous. He recommends that if an incision is made for the purpose of vaccinating, it should not draw blood, if possible to avoid this, and that it should not be more than one-eighth of an inch in length. If two such incisions are made, they should be one inch apart. If they are placed closer together than one inch, they are very likely to coalesce. If vaccination is done by the method of making a small abrasion, such as may be done with a specially prepared instrument, this should not be more than one-sixteenth of an inch in diameter, and if two such abrasions are made, they should be one inch apart. — *Health News*, U. S. P. H. Service.

THE EFFECT OF ENVIRONMENT ON THE UPPER RESPIRATORY TRACT*

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It is reasonable to expect that variations in the environmental conditions of the upper respiratory tract would effect characteristic changes in the activity in its function. Other organs of the body present characteristic physiologic variations which are well recognized even by the layman, and cause little or no concern. The reactions of the skin are somewhat similar to those of the upper respiratory tract because both are more or less exposed to the same conditions. The skin can be protected, however, according to the need. Sunburn causes no concern. The tanning following the sunburn is recognized as the end-result and a desideratum. A person who does not tan has learned to avoid exposure to the sunshine; so, too, certain persons have learned that their upper respiratory tract makes them uncomfortable when they are exposed to certain adverse weather and atmospheric conditions. Many other organs are managed from the standpoint of physiologic limitations.

The functions of the upper respiratory tract are: (1) moistening of the inspired air; (2) warming of the inspired air; (3) cleaning of the inspired air; and (4) olfaction, which is really a separate function and carried on by the highly specialized membrane lining. The available surface is increased by the provision of projecting plates, the turbinate bones in the nasal cavity, which are covered with functioning membrane. Without describing the nasal mucous membrane in detail histologically, it may be said in general that the membrane is covered by ciliated columnar epithelium, except in the olfactory area, and is inseparably united with the periosteum and perichondrium. The submucosa contains many glandular elements of the racemose type and is richly vascularized, especially by vessels arranged in sinuses and by a close capillary network. In structure, and in the nature of the nervous stimulus to which it may respond, it is analogous to, and even identical with, erectile tissue. Tiny capillary twigs are seen in contact with the basal layer of the gland epithe-

lium, and Wright has said that direct diapedesis of the white cells into the acini of the gland has been observed. The contractile elements of the stroma are composed of elastic tissue and involuntary muscle fibers. The glands and involuntary muscle fibers are innervated by the sympathetic coming through the sphenopalatine ganglion. It is thus evident that the reactions are entirely under vasomotor control, and are, in reality, automatic. Vasomotor dilatation entails not only an exudation of the serum from the blood vessels in the stroma, and a consequent swelling of it, but simultaneously a direct discharge into the glands and onto the surface of the mucosa. Around the gland ducts, whose mouths usually lie in a sulcus of the surface epithelium, is a more or less thick network of capillaries. Vasomotor dilatation of these capillaries would produce considerable constriction of the gland outlets. When vasoconstriction takes place there results a free discharge and a consequent shrinkage of the membrane. The natural nasal secretion has considerable bactericidal power; the olfactory secretion has not. It is seen then that the function of the upper respiratory tract proper is carried on by its highly specialized mucous membrane under vasomotor control.

Tatum has recently shown experimentally that the nasal respiratory mechanism is adaptive, lessening resistance when respiratory need is increased, and vice versa. The dilation of the vessels, when it is not carried to the point of rendering the amount of air supply to the lungs insufficient, not only renders the air warmer, moister, and freer from dust and bacteria when it reaches the pharynx, but, by reducing the space in the respiratory region of the nose, it directs a more copious supply of it toward the olfactory region. Wright says, "The internal configuration of every nose, even of those we would pronounce normal, varies so greatly that every nasal chamber is a law unto itself. Anterior and posterior rhinoscopy are often incapable of furnishing us with trustworthy information as to the efficiency of the nasal chambers in the performance of these functions. The statements of patients are still more untrustworthy. Some fail to appreciate even extreme nasal obstruction. Others complain of it when it manifestly does not exist. The clinical experience, the common sense of the physician, and his ability to judge the patient's temperament are more important guides to the appreciation of how these func-

*Read before the Minnesota State Medical Association, April 27-29, 1925, Minneapolis.

tions are in reality being performed, than the help his technical skill or the instruments of precision at his disposal furnish him."

Paget believes that the function of the nose is to filter the air and that the other ascribed functions are entirely subsidiary. He believes that nearly every healthy man has lost the power to breathe through his nose because of the tendency to alar collapse, and that if more respiration was nasal, there would be less pulmonary disease.

Chepmell, in discussing Paget's annotation, quotes Catlin's book, "Shut your mouth," written in the early forties. Catlin was impressed by the healthiness of the American Indian children, whose mothers insisted on their breathing through their noses. Hagemann believes that the function may be emunctory to a large extent. Wright said, "Vasomotor phenomena answer to every demand of physiologic need only so far as the mechanism is undamaged in all its parts. Repeated temporary exaggeration of physiologic response leads gradually to the graver forms of polypoid rhinitis and atrophic states."

The function of the nose is carried on by virtue of its internal configuration and the mechanism of its mucous membrane. As the air enters the vestibule, it takes an upward course, passes over the superior surface of the inferior turbinate, over both surfaces of the middle turbinate, and enters the pharynx. The membrane of the pharynx is essentially like that of the nose, except that it is not so specialized. In the pharynx, however, there is lymphoid tissue which is not encountered in the nose. In passing over these structures, the air currents take up the moisture from the surface, and are warmed and filtered. In expiration, the air currents are directed largely over the inferior turbinate. The function of the accessory sinuses in man is a moot question, but it is apparent that they are ventilated by the negative pressure effect of the passing air stream. The function of the tonsillar tissue in the pharynx is also a moot question; that it has a function in early childhood, even though it is not understood and cannot be specified, is quite probable.

Symptoms related to the upper respiratory tract are less common, and less often complained of, in a warm, equable climate. This is because there is less necessity for the nose to overfunction in order to prepare the air for the lower respiratory tract. Such a climate, however, has its definite draw-

backs, as it has been shown that mental and physical productivity is at a lower level than in less equable environments. Huntington, in his "Civilization and climate," proves that the output of factory workers increases as mean temperature decreases, and that no other elements of weather seem to have a real influence on such productivity. He attributes the superiority of persons who live in hard, rugged climates to the subjection of their bodies to frequent and extreme alternations of temperature. The reasonable physiologic explanation of this phenomenon seems to be the stimulation of vasomotor tonus.

Moore says, "Climate is the summation of atmospheric conditions as recorded for a long period of time," or, in other words, "it is the totality of weather, while weather is the physical condition of the atmosphere at a given time, or during a limited period."

James, in discussing the exact nature and effect of ventilation, says: "It was formerly thought that the atmosphere affected the body only, or chiefly, through the absorption of its elements by the lungs, but it has been found that this is not the case, and that these symptoms that accompany a stay in an ill-ventilated room are caused by the effect of the atmosphere on the surface of the body.

* * * In this connection, the various respiratory membranes are to be thought of as internal body surfaces, which are also brought into direct physical contact with the atmosphere. Heat, humidity, and stillness are the essentials in a bad atmosphere, and coolness, dryness, and motion of the air constitute good ventilation." Spratt drew the following conclusions: (1) the influence of climate in the etiology and treatment of disease has been overestimated; (2) acute and chronic inflammation of the respiratory tracts are more frequent and worse during the winter months; (3) these conditions are not due to cold, but to certain artificial conditions under which the individual lives from six to eight months, the artificial climate, including crowding, dust, overheated rooms with dry air, sudden changes from heated rooms to cold outside air, and deficiency of sunlight; and (4) diseases of the ear, nose and throat are common in the north due to these conditions.

From what has been described as the normal physiologic reaction of the nose, it can be seen how, with a perfectly acting mechanism, and particularly the vasomotor mechanism, the nose would

adapt itself to different atmospheres. In the variable, rugged climate of the Northwest, with frequent weather changes, the upper respiratory membrane might be expected to become hypertrophic; whereas, in the warm, equable climate, where the nose is not required to function excessively, there should be very little change. It is easy to understand, then, that in our section of the country, in adolescent and early adult life, many symptoms might arise from the physiologic activity of the respiratory membrane, particularly as it is at this period of life that the erectile tissue function is at its height. This is why many such persons complain of nasal obstruction and excessive secretion. It has been variously estimated that secretion from the respiratory membrane might amount to from a pint to a quart a day. Patients often complain of obstruction on alternate sides, but, as a matter of fact, this is quite normal. Scarcely ever are both sides of the nose open to the same extent, for the reason that there appears to be a cycle of reaction; that is, while the mucous membrane of one nostril is filling to a point approaching obstruction, the other nostril is opening and throwing off its secretion, and by the time the nostril that is filled has completed the opposite phase. The cycle may not always take place quite to the extent described.

Patients often complain of obstruction at night on the side on which they are lying. This is the result of passive congestion and is quite a normal condition. Complaint is also made of a considerable amount of secretion in the pharynx in the morning, which may be quite natural, inasmuch as there is a collection during the night which has not been disposed of, as it would have been during the day by involuntary swallowing. Many such persons feel that the condition is detrimental to their health, but I have seen no evidence of this; it is usually the most robust type of patient who has this kind of complaint.

With the condition of hypertrophic rhinitis superimposed on nasal obstruction caused by anatomic defect, such as a crooked septum, the symptoms are naturally aggravated. In other words, there is an anatomic and a physiologic obstruction. Often, in this type of case, the correction of the anatomic obstruction by some operative measure which conserves the membrane will largely relieve the symptoms. If not, a change to a high, dry climate will often effect the change by natural

processes. The dry and equable atmosphere will take up the excess secretion that the hypertrophic mucosa is producing, and there will be little or no variation to cause the excessive physiologic responses. It is in this type of nose that destructive intranasal operations were often performed formerly, but I believe they are contraindicated.

Occupation has a great deal to do with the physiologic responses of the upper respiratory membranes. It has been shown that steam laundry workers, who have been engaged in this type of work a long time, invariably present rather definite grades of atrophy of the membrane of the nose. This can be explained on the basis of climatic conditions, already discussed. The lumberjack, the farmer, the delivery man, and others, who are constantly out of doors in all kinds of weather, are not subject to infection of the upper respiratory tract, or to those symptoms seen so often in persons who live a sedentary, indoor life. Attention to personal hygiene will in some measure relieve the symptoms. The city dweller has found that he must protect his feet from wet or cold, or have a "cold in the head." "The man clad all day in the same kind of clothing finds that he can not remove any part of it without the risk of taking cold. His wife wears high shoes or spats during the day, when it is warm, and has her neck and chest protected, but in the evening, attending a social function, she apparently disregards all sane principles of dress; yet it is observed that she is less disposed to catch cold than the man."

This is another example of the hardening process. The vasomotor tone is better developed in those who expose the surfaces of the body and change the clothing to suit the occasion than in those who always dress in the same manner. Susceptibility to the physiologic changes can be largely controlled by training; that is, the city dweller can become a farmer or a rural delivery man, and gradually acquire the same physiologic reactions; and the reverse is true.

The best example of the hardening process is seen in the American Indian of former years. If asked why his body needed to be so lightly clad in inclement weather, he would answer, "Me all face."

There is another type of physiologic reaction within the nose which is due to some derangement of the sympathetic nervous system, and results in what is called a vasomotor rhinitis. It may be

occasioned by susceptibility to proteins, bacteria, food, and pollens, and can sometimes be controlled by removing the causal factor if it can be ascertained. Sometimes, if the causal factor cannot be readily discovered, topical application to the region of the sphenopalatine ganglion, as shown by Sluder, is beneficial. Sneezing, according to Brubaker, may be the manifestation of the vasomotor rhinitis. It is customary for the human being, in order to clear the nose, to blow it in some manner, and he usually closes the open nostril and blows against the opposite one. This creates a strong positive pressure in the nasopharynx, and may produce untoward results, because it may cause infection of the ear or accessory sinuses. Animals are seldom affected because their only method of clearing the nose is by sneezing.

SUMMARY

If the upper respiratory tract is considered an organ, the normal functioning of which is necessary for the general well-being of the body, the explanation of certain physiologic reactions due to environmental conditions is incumbent on the medical advisor.

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DISCUSSION

Dr. J. A. PRATT, Minneapolis: The doctor states that one function of the nose is moistening the inspired air, and, while it is the usual theory taught, I feel it is not a function but an incident. In a normal nose we should have enough moisture to keep the tissue in a functioning condition, and stop irritation by friction of the passing air currents.

It is normal for all animals to breathe through their noses. When this is not done normally, it is due to mechanical obstruction. All defective noses, in time, will try to reconstruct themselves to be as near a physiological functioning nose as possible and this is accomplished by compensatory hypertrophies and atrophies.

I believe that the function of the sinuses is negligible and that they are entirely vestigial, having possibly as much to do with the function of the nose as the appendix has with the function of the intestines.

I did not know that each nostril operates separately as opening and throwing off its secretion in a cycle manner. This may be true, but it does not agree with my understanding of the physiological action of the nose.

I heartily agree with the doctor that operative measures should conserve the nasal membrane and that destructive intranasal operations should not be performed.

The presence of atrophic changes in the nasal membrane in laundry workers may be explained by certain hypo-physical conditions brought about by the working conditions. In practically every case of atrophic rhinitis, regardless of occupation, there is a hypo-physical condition present.

The lack of sickness as to respiratory diseases of our female population, who expose themselves quite as much as the American Indian, hardly reconciles one's past teaching that respiratory diseases are caused by drafts, wet feet and insufficient clothing. If this is a gradual hardening process, then I am quite sure a normal nose can adjust itself to any atmospheric change.

I believe, if we have normal action of our protective body functions, we can adjust ourselves to all atmospheric changes. If we are lacking in certain or part of certain functions, we will do better in atmospheric conditions which supply this deficiency.

I am afraid the doctor is not strong on pets, because the dog and cat clean their nasal passages, not only by sneezing, but by hawking.

If our mothers would teach their children to hawk (in private), we would have less ear infections. Every

one who has a suppurating affection of the nose should hawk the discharge out rather than blow it.

To repeat—if we have a normal functioning nose, we can adapt ourselves to any climate.

DR. HORACE NEWHART, Minneapolis: I feel that Dr. Lillie in his very excellent paper has rendered us a decided service in pointing out to the general practitioner and the rhinologist the fact that many of the symptoms of which our patients complain, so far as the upper respiratory tract is concerned, are due, not to causes existing within the individual, but to causes entirely apart from him in his environment. One big factor, the one which we do not as yet all recognize, but which many are trying to combat, is that of insufficient humidification of the air we breathe.

Take a typical case who comes to us occasionally in such a condition as to suggest that he is neurotic, complaining of irritation of the naso-pharynx and an accumulation of desiccated secretion. He has a sore throat with irritation and cough. He states that he has more or less dropping into the throat. The careful examiner going over such a case will first of all exclude empyema of the paranasal sinuses. He will also exclude a deviated nasal septum, which may be the cause of an increased negative pressure with excessive secretion and the above symptoms. However, if this patient is seen sufficiently early in the day, before, through swallowing and eating, he has disturbed the accumulated secretions, one will find on the fauces a greater or lesser amount of extremely dry, tenacious secretion which is responsible for many of the symptoms of which the average patient of this class complains.

Unfortunately, many of these patients have been the victims of one or more operations, suggested with honest intent by the operator, who had sincerely hoped to relieve the patient's condition. Too often, however, the environmental factor has been completely overlooked,—that is, the important factor of decreased humidity. Dean E. P. Lyon of the Medical School of the University of Minnesota has worked extensively on the subject of proper humidification of the air in our homes and has given us some very interesting facts. Among other things, he has shown that in the average home in this climate—and, of course, we have in mind just now patients living particularly in this northern climate with severe winters—with its excessively dry atmosphere superheated, is altogether too lacking in moisture content for health. This is equally true of the air in our schools, offices and factories. The result is, naturally, irritation through desiccation of the surface of the mucous membrane with at first an attempt to make good the deficiency by hypersecretion. Dr. Lyon has brought out the fact that the remedy as ordinarily suggested for our homes, consisting of attaching to the radiator a small ready-made humidifier, is absolutely inadequate to the requirements. It has been shown that one of these ready-made humidifiers actually produces less moisture in the air than is exhaled and evaporated from the skin of a single individual. For the average dwelling house from 25 to 75 gallons of water should be evaporated in twenty-four hours in order to produce the desired results. This is allowing for a change of air at the usual rate.

During the past few months I have been very much impressed by the results obtained by the successful arti-

ficial humidification of the air in the residences of some of my patients (I might as well say "ex-patients" now, for they very seldom consult us in regard to the upper respiratory tract disturbances, of which they frequently complained and for which they often consulted the rhinologist). Without going into details, these new and successful systems of humidification consist of a small plant, electrically driven, by which at least 50 per cent of the maximum humidity is automatically maintained. The results in the homes in which this humidification has been successfully carried out are not only gratifying, but even surprising in the reduction of the number of "colds" among the occupants. In several instances we have noted a decided improvement in the symptoms of individuals suffering from chronic so-called "catarrhal deafness."

Another practical way of partially meeting the situation and in handling these patients is to have them sleep out of doors the year round where, during the sleeping hours, they have the advantage of the natural air not deprived of its moisture content through excessive heating.

We believe that a more universal application, in a practical way, of artificially producing greater humidity in our dwelling places and working places will go far toward overcoming the conditions to which the essayist has so ably called our attention.

DR. H. I. LILLIE (closing): The moistening of air is an important function of the nose. This can be shown experimentally by having dry air inhaled by a tracheotomized animal, then taking it from the trachea and getting the moisture content. Further, it can be shown experimentally that the warm ether vapor given for inhalation purposes for anesthesia has the same temperature in the trachea as cold ether vapor given in the same manner.

So far as the cycle of function of the nose is concerned, one accustomed to looking through a nose speculum has seen the membranes on one side of the nose swollen and on the opposite side covered with little droplets of secretion. In five minutes that membrane will be seen to have shrunk more and the membranes on the opposite side to have swollen more. That is in line with the experimental work carried on in the University of Chicago during the last few years, showing the adaptive mechanism of nasal respiration.

Possibly I was misunderstood with regard to atrophic rhinitis. By atrophic states of the membrane I do not mean ozena or fetid rhinitis, but secondary atrophy of the membrane. It is different in appearance from hypertrophic or normal type of membrane, and the secretion is different from the normal.

Naturally, symptoms can be aggravated by anatomic defects, and I suggested that there were anatomic defects which interfered with the respiratory function. These should be corrected, but in correcting them it is not necessary to destroy important functional membrane. In other words, we must look at our patients as a "whole" and not through the "hole" of the nose speculum. That muco-purulent secretion in the nasopharynx may cause symptoms is a well directed point. In that type of nose, the function is not being carried on properly, due to environmental conditions, as Dr. Newhart has suggested, and the proper amount of humidity in the environs will usually correct the fault.

But, on the other hand, topical applications to the membrane, in my experience, do little good. Stimulating the glands to secrete will cause the symptoms to disappear if environmental conditions are corrected.

Animals do hawk. I had a dog, I usually have quite a number of them, who had a pansinusitis. Necropsy showed that all the paranasal sinuses were involved. Veterinarians have told me that this condition usually is an aftermath of distemper. A notable example of maxillary sinusitis in a dog is that of one used for breeding purposes at the present time, which was cleared up by a maxillary sinus operation. It is difficult to determine which sinus is involved in animals. The sense of smell is nearly always interfered with.

Examination of Some Liquid Petrolatum Agar Emulsions.

—At the request of the Council on Pharmacy and Chemistry the A. M. A. Chemical Laboratory has elaborated a method for the analysis of mixtures containing liquid petrolatum and agar. In connection with this work, the Laboratory analyzed some of the preparations on the market. Agarol Compound (William R. Warner & Co., Inc.): The formula of this preparation is not divulged and no claims for its composition are made except that it contains liquid petrolatum and agar (in unstated amounts) and $\frac{3}{4}$ of a grain of phenolphthalein in each teaspoonful. Of the preparations examined, Agarol Compound was the lowest in liquid petrolatum. Possibly its low value in this essential may account for its having been reinforced by phenolphthalein. Agrilin (Lehn & Fink, Inc.): This is claimed to contain liquid petrolatum 38.6 per cent, and agar 2.25 per cent. The analysis indicated about 90 per cent of the claimed amount of liquid petrolatum and about 64 per cent of the claimed amount of agar. Petrolagar (Deshell Laboratories): At the time of its introduction, this was claimed to contain "10 per cent of prepared agar-agar" and 65 per cent of liquid petrolatum. In response for a definite statement of composition requested by the Council on Pharmacy and Chemistry, the firm stated the preparation to contain liquid petrolatum U.S.P. 65 c.c. and agar U.S.P. 10 gm. in 100 c.c. The Laboratory did not confirm the claimed composition. It contained the highest proportion of liquid petrolatum of any of the preparations examined, but was relatively low in agar content. Since the analysis was made, the manufacturer has informed the Council on Pharmacy and Chemistry that the product now being marketed contains one and one-half per cent of agar U.S.P. Squibb Liquid Petrolatum With Agar (E. R. Squibb and Sons): This is stated to contain 50 per cent of liquid petrolatum and 1.5 per cent of agar. These claims were substantially confirmed by the analysis. Terralin With Agar-Agar (The Hillside Chemical Company): No claims for the composition are made except that it is "petroleum purificatum with agar-agar." The Laboratory reports that the petrolatum in the preparation cannot be considered liquid petrolatum of U.S.P. quality. The preparation contained 39.8 per cent of liquid petrolatum and about 0.3 per cent of agar. (Jour. A. M. A., May 30, 1925, p. 1682.)

POSTOPERATIVE PULMONARY COMPLICATIONS*

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One of the most distressing tragedies of hospital experience, both to the surgeon and to the relatives of the patient concerned, is to see a young, healthy individual come into the hospital for a simple operation of choice and die of a postoperative pulmonary complication.

Usually the surgeon classifies it as a postoperative pneumonia, and one of the uncontrollable accidents of surgery, attempting to console the relatives with the thought that, even though it was a most sad and distressing culmination of a successful operation, it was incidental to a secondary risk in no way dependent upon his surgery. In the past, surgery itself has taken little credit for the responsibility of these complications; it has been much more easy to explain everything on the basis of the anesthesia, leaving the impression, both with the profession and with the laity, that the anesthetist, and not the surgeon, bore the responsibility for whatever defense the lungs are granted during and after operation.

Fortunately, all patients who develop postoperative pulmonary complications do not die; many cases are not even diagnosed. It appears from a large number of statistics, however, that one in every thirty to fifty patients operated upon develops a pulmonary complication, and one in every one hundred and fifty to one hundred and seventy-five dies, giving a morbidity of between 2 and 3 per cent, and a mortality of about .6 per cent. Statistics vary according to the type of surgery which is done. In hospitals and clinics where selective surgery is being done, the percentage of postoperative pulmonary complications is lower than in those where urgent and desperate risk cases are treated. It is evident that, aside from the fatal termination, postoperative pulmonary complications play a very important rôle from the standpoint of delayed convalescence, secondary complications, and economic loss.

In recent years there has been an increasing attempt to study this problem both from a scientific aspect and from an economic point of view. Evi-

*Read before the Minnesota State Medical Association, Minneapolis, April, 1925.

dence of the latter is seen in the fact that many hospitals are analyzing all cases of delayed convalescence, with a view to determining the cause and providing a remedy. Recent medical literature shows that there has been an ever-increasing effort in many of the American hospitals to analyze histories and to determine the end-results in the surgical cases, and it is to be noted that the study of postoperative pulmonary complications is given a prominent place. In many hospitals the diagnosis and recording of these complications, however, is too frequently left to the intern or not recorded at all. It has been my observation, in attempting to review surgical records from the standpoint of pulmonary complications, that the data have been most inadequate and insufficient to form any definite opinion as to what complications occurred. However, where careful records have been made, and a systematic attempt made to record and classify all complications, very valuable data are obtainable. From such data it is evident that there has been a definite increase in the morbidity percentage, with a corresponding decrease in the mortality percentage. It has also placed in the discard the old designation "ether pneumonia," and brought to the foreground the embolic theory, which appears to be the most logical and satisfactory explanation in the majority of postoperative pulmonary complications.

Cutler and Morton,¹ in 1917, reporting on 3,490 cases at the Massachusetts General Hospital, had a pulmonary morbidity of 1.86, with a mortality of .94. Cutler and Hunt,² in 1920, reporting from the Peter Bent Brigham Hospital, out of 1,562 cases, had a pulmonary morbidity of 3.52, and a pulmonary mortality of .7, whereas in 1921,³ out of 1,604 cases they had a pulmonary morbidity of 3.92, and a mortality of .31. Likewise, at the Presbyterian Hospital in New York, where this question was given careful study, the morbidity increased from 2.3 per cent in 1915 and 1916,⁴ to 3.3 per cent in 1917.⁵ Elwyn,⁶ in reviewing 2,932 cases at the Mount Sinai Hospital in New York, from March 8, 1921, to Sept. 1, 1922, reported a morbidity of 2.76 per cent, whereas in the period from Sept. 1, 1922, until Sept. 1, 1923,⁷ out of 1,734 patients to whom a general anesthetic was administered there was a morbidity of 3 per cent, and of 399 patients operated under local anesthesia there was a morbidity of 2.7 per cent. This increase in morbidity is partly accounted for by the fact that numerous

unexplained "postoperative reactions" had definitely been recognized and classified as pulmonary complications.

At St. Mary's Hospital, Duluth, in 1923, there were seventeen cases of postoperative pulmonary complications reported out of a total of 979 major operations, giving a morbidity of 1.7 per cent. During 1924, when the members of the staff were urged to make a more careful study of all postoperative reactions, there were twenty-seven cases of postoperative pulmonary complications out of a total of 1,254 major operations, giving a morbidity of 2.15 per cent. The mortality percentage during 1923 was .61 per cent, and during 1924, .63 per cent.

In 1924, out of 511 major operations performed at St. Mary's Hospital by surgeons of the Duluth Clinic, sixteen developed postoperative pulmonary complications, giving a morbidity of 3.13 per cent. There were five deaths, due to the postoperative pulmonary complications, resulting in a mortality percentage of .97. The mortality percentage of the morbidity was 31.2. During this time the postoperative course of all surgical patients was carefully watched, and an attempt made to classify all complications.

In the past the anesthetic has been considered the most important factor, and by many the only factor, in these complications, but it is now evident that its chief effect is only contributory, and that it should be considered with such other secondary factors as infection, pre-existing lung disease, debility, chilling of the body, surgical manipulation and type of operation done.

Cutler¹ was one of the first to explain these postoperative pulmonary complications on the basis of embolic origin. Recent articles (Herb,⁸ Lee,⁹ Wharton and Pierson¹⁰) are supporting his views, and it seems that careful physical and roentgenological examinations, with a correct interpretation of them, will place the majority of postoperative pulmonary complications in the embolic class.

However, there are still many men who are convinced that the anesthetic plays the most important rôle, and ascribe the lung insult to aspiration and irritation. It is unquestionably true that some cases can be explained on this basis. However, if it does play such an important rôle, it is difficult to account for the fact that postoperative pulmonary complications occur in local anesthetic operations, producing almost as high a percentage as where a

general anesthetic is used. Elwyn⁷ believes that the greater number of cases of postoperative pulmonary complications are due to small or large areas of atelectasis or collapse in the lungs, but he is unable to explain why these should occur. Scott¹¹ suggests that infarction, in an atelectatic area, may be the usual mechanism of postoperative broncho-pneumonia.

Mandl,¹² reporting from Hocheneggs' service at Vienna, shows a percentage of 10.9 in 227 cases of hernia performed under local, and a percentage of 9.8 in 415 operations performed under general, while in gastroenterostomies for carcinoma the percentage where local was used was 22.2 per cent, against 15.9 per cent where a general anesthetic was used.

We must not forget, however, that surgery performed in European clinics is on older and more neglected patients than on the usual American groups. This fact would modify the choice of anesthetic and its influences.

Furthermore, these postoperative lesions are usually situated in the lower lobes, more frequently on the right side than on the left, and thus are comparable to pathologic studies on embolism and infarction.

It is true that the anesthetic plays a contributing rôle in certain cases, especially where there is a focus of pulmonary disease present. It cannot be questioned but that it will cause a flareup of a quiescent tuberculous lesion at times, or of an old bronchitis. These, however, occasionally flare up following operations under local anesthesia. Likewise, the importance of sepsis as a secondary factor cannot be denied, and often in septic abdominal lesions the lung is involved by direct extension. Chilling and cold undoubtedly are of importance, in that the resistance is lowered to infection. Evidence of this is seen in many cases of this type where the Group IV pneumococcus is found.

It is now generally accepted that the site of operation and the character of the operative procedure are constant and all-important factors. Statistics show that the relation of the operative field to the diaphragm bears a direct relation to postoperative pulmonary complications, and this relationship appears to be the most constant of all etiological factors. Cutler and Hunt,³ in a group of sixty-three cases of postoperative pulmonary complications, report 68 per cent following laparotomies. Mandl¹² reports a morbidity of 14.5 per cent in

abdominal and hernial operations, with a morbidity of 8.5 per cent on all others. A recent report from the Mount Sinai Hospital⁶ at New York gives still higher figures: In 1,087 operations of the stomach, gallbladder, ducts, appendix, hernia, small and large intestine, and exploratory laparotomies, the morbidity percentage was 6.29, whereas in 1,852 operations on other parts of the body the morbidity percentage was only .7 per cent. In operations on the stomach, the morbidity percentage was 13.8 per cent.

At St. Mary's Hospital, in 1923, 70 per cent of the postoperative pulmonary complications were on abdominal cases, whereas in 1924 the percentage was 66.

These figures have been variously interpreted. Many men claim that the splinting effects on the diaphragm produced by abdominal operations cause a decreased aeration of the lungs, with an increased congestion, making an ideal site for the development of infection. There are several reports which show a decrease in the pulmonary morbidity by routinely employing such means as deep breathing exercises, counter-irritants, and preoperative administration of digitalis. On the other hand, others, like Cutler and Hunt,^{2,3} interpret this on the basis of an increased mobility of the operative field, and especially the abdominal wall, with a greater tendency toward the liberation of emboli. Further studies will undoubtedly show that the latter view is probably correct. It would appear, however, that an embolus lodging in a congested area would produce more symptoms, due to a greater area involved, especially if the emboli are from a septic field. It is also evident that a pulmonary infarction would be of less serious consequence where the pulmonary circulation was normal.

Various classifications of postoperative pulmonary complications have been brought forward. Of these, the classification of Cutler and Morton⁴ appears to be the simplest and causes the least difficulty in dividing the various cases. The divisions of this classification are:

1. Pulmonary infarction—small emboli from the operative field.
2. Lobar and broncho-pneumonia.
3. Bronchitis.
4. Pleurisy.
5. Pulmonary embolism, due to large emboli occluding the main trunk of the pulmonary artery or its principal branches.

6. Empyema.
7. Lung abscess.
8. Cases in which there has been an exacerbation of a tuberculous lesion.

According to this classification, out of 1,604 cases occurring at the Peter Bent Brigham Hospital from Jan. 1, 1920, to Jan. 1, 1921, Cutler and Hunt³ reported sixty-three cases, or 3.92 per cent morbidity. All of these cases were very carefully studied, and controlled by means of the roentgen ray. Out of this number there was only one case that could be classified as "lobar pneumonia," and this occurred in a patient operated on under a local anesthetic for an indirect left inguinal hernia. There were seven cases of broncho-pneumonia, all operated on under a general anesthetic. Sixteen cases were classified as "bronchitis," in eleven of which there was evidence of previously existing pulmonary disease, two cases of pleurisy, one case of empyema, and two cases of pulmonary embolism. Under the classification of "pulmonary infarction" there were thirty-two of the total sixty-three complications.

In classifying the postoperative pulmonary complications occurring at St. Mary's Hospital in 1923, the diagnoses of the attending physicians were accepted. However, during 1924 the classification was made according to the subjective and objective symptoms presented. Of the seventeen cases in 1923, there were six cases of lobar pneumonia, four cases of broncho-pneumonia, three cases of bronchitis, two cases of pulmonary infarction, one case of pleuritis, one case of lung abscess. In 1924 there were three cases of lobar pneumonia, and one of these possibly was embolic; two cases of broncho-pneumonia, one of which died suddenly, suggesting pulmonary embolism; eight cases of bronchitis, nine cases of pulmonary infarction, three cases of pulmonary embolism, one case of pleurisy, one case of postoperative massive collapse.

In the Duluth Clinic series there was one case of lobar pneumonia, one case of broncho-pneumonia, five cases of bronchitis, six cases of pulmonary infarction, two cases of pulmonary embolism, and one case of postoperative massive collapse.

The cases of pulmonary infarction form a group with a rather typical clinical picture—the abrupt onset, the characteristic physical signs, and the sudden subsidence (except when the emboli arise

in a septic field). The clinical picture has been very clearly described by Cutler,³ Wharton and Pierson.¹⁰ The onset occurs usually with sudden pain on respiration, almost always situated along the costal margin, below the axilla or scapula. Preceding this there is usually a rise in pulse, temperature and respiration, and with the pain these may increase. The temperature, however, is usually not as high on the first day as it is on the second day or the third. In about half the cases a slight cough develops, and the patient may expectorate a moderate amount of frothy sputum, which is often blood-tinged. Immediate auscultation of the chest usually reveals one or more small areas filled with fine râles, with some impairment of breath sounds. If the focus is sufficiently large there will be some change in fremitus. A friction rub may be the most distinct sign, but is present only when the area of the infarct reaches the periphery of the lobe. Some of the smaller thrombi do not cause sufficiently large infarcts to do this.

With regard to the time of onset, there is some difference of opinion. From Cutler's work,^{2,3} it appears that it can appear as early as within twenty-four hours. In his series, the onset in twenty-one of the thirty-two cases was within the first four days, and in six cases it was within twenty-four hours. Wharton and Pierson¹⁰ state that the onset is usually during the second or third week, while Hampton and Wharton,¹³ in reporting on fifty-one different cases at Johns Hopkins Hospital with pulmonary infarction or pulmonary embolism, found that in 75 per cent of cases the onset was during the second and third week, and 20 per cent after the third week, and in only 5 per cent during the first week.

Radiographs will invariably demonstrate small areas of consolidation, which from time to time will take the form of cone-shaped shadows, with the base outward. Unless these roentgenograms are taken early they may fail to show these shadows, as these lesions chiefly represent merely a change in blood distribution and soon clear up. The return to normal, as a rule, is complete in six or seven days.

An interesting case reported by Whipple,⁴ from the Presbyterian Hospital, New York, illustrates this type of case:

A young woman, operated on under ether anesthesia, for dilatation of a stricture of the rectum, developed general peritonitis from an unrecognized perforation, and died within thirty-six hours. Ten hours before she died she

developed dullness, distant broncho-vesicular breathing, over the posterior part of the left lower lobe. She was radiographed, and there was a shadow in the left lower lobe. The autopsy showed no hepatization nor definite consolidation, but very marked congestion of the vessels, with exudate in the alveoli devoid of fibrin. The two lungs removed at the autopsy were radiographed and showed the same relative shadow in the left lower lobe.

This illustrates the possibility of obtaining early roentgen evidence. It likewise shows that congestion, without the presence of fibrin, such as found in an early infarct, can be definitely demonstrated with the roentgen ray.

It is quite evident that a large number of the cases classified by Cutler and Hunt as "pulmonary infarctions" were of the type previously called "postoperative reactions." It also appears, on looking over the older reports on postoperative pulmonary complications, that the symptomatology described would place a great many of the so-called "pneumonias" in this class.

There is one other postoperative pulmonary complication whose incidence is probably constant and much more common than suspected, namely, postoperative massive collapse of the lungs. According to Scott,¹¹ there have been sixty-four cases of this condition reported in the literature. Twenty of these have been reported in the three years since 1921. Two years ago, before the Minnesota State Medical Society, Hirschboeck¹⁵ reported four cases from St. Mary's Hospital. One other case was diagnosed during the past year. Undoubtedly a far larger number have been recognized but not reported.

Several recent articles,^{9,11,14,15,16,17,18} as well as one System of Medicine,¹⁹ have described in detail the symptoms. Briefly stated, they are as follows:

A few hours to as long as seven days after a surgical operation (usually abdominal) the patient suddenly presents the symptoms of a catastrophe. In the mild to moderately severe and latent cases the symptoms are less pronounced or practically absent. There is usually only a moderate febrile reaction, unless infection is coincidentally present, when the temperature may rise to 104, or even higher. There is usually an increase in the respiratory rate. A pulse rate and a respiratory rate directly related to the febrile reaction are to be expected. The physical signs in the chest are perhaps the most characteristic findings. On inspection, a diminution or absence of respiratory movements of the chest wall over the affected area

is noted. The intercostal spaces are narrower than upon the normal side. The cardiac impulse is displaced toward the affected side. In left-sided cases the apex has a tendency to tilt outward and upward, so that the apex impulse of the heart-beat may often be felt in the axilla, while in right-sided cases the impulse may be felt at the tip of the sternum or even to the right of it. The dome of the diaphragm on the affected side is abnormally high, and this can readily be detected by percussion in the left-sided cases.

Over the collapsed area the breath sounds are either greatly diminished or suppressed, or bronchial in character. The bronchial breathing is usually accompanied by bronchophony and pectoriloquy, while the diminished breath sounds are usually associated with diminished vocal fremitus. Scott¹¹ has observed marked diminution in breath sounds during the development of this condition and a later replacement by loud bronchial breathing.

I shall not further discuss the physical signs, as they vary according to the involvement and the time of observation. The roentgenogram is of the greatest corroborative aid.

As to the etiology of this condition, there are probably several factors:

1. Bronchial obstruction, due to mucous plugs or foreign bodies.
2. Paralysis or bronchial spasm due to reflex irritation from other parts of the body.
3. Arrest of the respiratory muscles, either of the chest walls or of the diaphragm itself. This arrest may be caused by direct nervous influence or by posture.

Scott¹¹ believes that there must be some reflex which causes a constriction in the air passages, probably affecting the small bronchioles, not dependent originally on infection, and acting on both lungs to some extent. In respect to the exact channel through which this reflex acts, he mentions three possibilities: (1) vasomotor; (2) bronchiole spasm; (3) swelling of the mucous membrane.

With regard to treatment of postoperative pulmonary complications, prophylaxis unquestionably plays the most important rôle. Prevention consists in eliminating as far as possible, or combating, where elimination is impossible, the predisposing factors in the etiology of the complication. In

every operative case special effort should be made to elicit a history of recent or recurrent infection of the respiratory tract, and to check the history by careful examination. Except in cases of real emergency, patients giving such a history or showing physical signs of an inflamed respiratory mucosa, should be urged to wait for at least a week after all evidence of such infection has disappeared. Care should be exercised in the choice and administration of the anesthetic. Exposure of the patient before, during, and after operation, to currents of air and chilling, should definitely be avoided. Reduce as far as possible all trauma during operation. Maintain accurate hemostasis and control sepsis. Furthermore, a high fluid intake and all general precautions giving assistance to the circulatory apparatus will be of definite value once such complications are established.

CONCLUSIONS

My brief discussion of this very important subject has been for two purposes:

1. To call attention to the high percentage of postoperative pulmonary complications.
2. To emphasize the importance which pulmonary embolism and infarction play as the real etiological factors in postoperative pulmonary complications, and that other factors, formerly considered of prime importance, such as anesthesia, infection, pre-existing lung disease, old age, debility, and chilling of the body are rather of a secondary nature.

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DISCUSSION

DR. HAROLD EDWARD RICHARDSON, St. Paul: The presentation of this important subject by Dr. Boman has been very interesting. It is a subject which demands the attention of every surgeon. True enough, these particular conditions are relatively infrequent, but when one does occur it is at least disconcerting and, oftentimes, a real catastrophe.

I am very glad that Dr. Boman put prophylaxis first when he took up treatment, for it appears to be the all-important element. In so placing it he puts the responsibility for these conditions directly where it belongs, and that is upon the surgeon himself. If we are going to do anything to prevent these conditions the very least we can do is thoroughly and routinely to examine our patients before operation. It is extraordinary that in this day of remarkable advancement in medical science we are still seeing patients coming to major surgical operations without any physical examination except that of the part involved.

Dr. Greene called my attention recently to the case of a patient who was subjected to a major surgical operation of convenience despite a readily distinguishable and easily diagnostic aortic aneurysm with obvious and marked manubrial pulsations. This condition had been entirely overlooked. The patient died on the operating table.

Frankly a lack of knowledge of the condition of the heart, lungs, kidneys and blood before operations of choice is inexcusable. Every patient is entitled to a thorough and complete physical examination before operation. A careful history should be taken, a thorough physical examination made and wherever practical an electrocardiographic record should be obtained inasmuch as some of the most dangerous surgical risks are those carrying breast lesions readily determinable by the electrocardiograph, and by no other means. We should pay much more attention to minor cardiac dilatations and to symptoms of myocardial insufficiency. The urine should be carefully investigated and certainly, wherever practical, these patients should have a phthalein excretion test.

A remark that Dr. Litzenberg made to his students some years ago I think very aptly applies here. He said at that time that the obstetrician should never lose sight of the fact that his patient consists of more than just a pelvis. Likewise our surgeons, also, should never forget that their patient consists of more than merely an abdomen to be opened or a hernia to be repaired. We must never lose sight of the three most vital organs: the heart, the lungs and the kidneys. There is always too great a tendency both to hurry our patients into the hospital and to hurry them out.

Some surgeons boast of the fact that their thyroid cases leave the hospital in four days, their appendix cases in nine days and their gallbladder cases in fourteen days. This is merely a confession of the fact that the surgeon is placing his own reputation before the actual welfare of the patient. If we are going to pay any attention to the economic loss of the individual patient, we cannot blind ourselves to the fact that these people are a long time in recovering wholly from major surgical operations. This time could be materially shortened by keeping these cases

in the hospital after operation sufficiently long to enable them properly to regain their strength and endurance. As Dr. Greene has aptly said, if a surgeon is to appreciate properly the point of view of the patient he should have a major surgical operation performed on himself once every year.

Many patients need rest and upbuilding before a major surgical operation is attempted, and after the operation they should be given sufficient time to make at least a partial convalescence before they are thrown on their own resources.

Instead of pulmonary embolism being the most important causative factor in these cases, it seems rather that we can go still one step further back and say that the important rôle played by embolism is the result of a deficiency of the circulation. It is questionable, if the circulation is normal, that emboli such as are thrown off from the site of operation can play as important a rôle as we might think on first impression.

In connection with what I have said regarding the important part played by the circulation in the development of postoperative pulmonary complications, it is interesting to note that in the slides Dr. Boman has just shown, the heart in every one was very definitely enlarged.

DR. N. M. KEITH, Rochester, Minn.: These pulmonary complications are of interest not only to the surgeon but also to the physician. At St. Mary's Hospital our general conclusions as to preoperative examination, and morbidity, are practically the same as Dr. Boman's. There is no doubt that pulmonary infarction is much more often diagnosed now than it was say ten years ago.

Perhaps the most important clinical work on pulmonary infarction was done by Dr. L. A. Conner of New York about 1912 on cases of typhoid fever. He showed very clearly that in cases of thrombosis, particularly femoral thrombosis, pulmonary infarction often gave us the clue of the venous thrombosis before there were clinical local symptoms. That is, pain in the legs, for instance, or pain in the calves, would be followed by pulmonary infarction two or three days before the edema and all the other signs of local phlebitis. In this way the clinical knowledge that pulmonary infarction does often occur and that the symptoms are typical is an aid to early diagnosis.

There is no doubt that in upper abdominal operations, particularly on the stomach, pulmonary complications are more common; and there is no doubt that with more accurate preliminary examination these complications can be reduced. A thing that our surgeons are stressing at the present time is the use of the new anesthetic, ethylene. They feel that since they have been using ethylene they have got fewer complications. I believe that with ethylene they are giving the anesthetic probably more carefully than they did the routine ether anesthetic.

It does not seem to me that yet we know the exact causes of these postoperative pulmonary complications. Pulmonary infarction is a typical clinical entity. Similarly bronchopneumonia has usually a clean-cut clinical picture. Now, why do some patients get bronchopneumonia and some patients infarction? If pulmonary embolism is the cause you would think pulmonary infarction would be more common. Dr. Lemon in the last year has done some very inter-

esting experimental work on dogs with anesthetics. He gave these animals ether for a period of forty minutes. During this time he put foreign substances like certain dyes, lampblack, and certain opaque solutions as bismuth and barium in the animal's mouth. The interesting thing he found was that the position of the animal at the time of the anesthesia made a great difference, and that in a great many of these animals these substances passed down the trachea and reached even the terminal alveoli. That would seem to show that there is a remarkably effective reflex mechanism in the upper respiratory passages for preventing the spread of infection to the lungs, and that anesthesia must play a part in breaking down that mechanism.

DR. G. D. HEAD, Minneapolis: Inasmuch as you are kind enough to ask me to say a word, I will do so, although I would rather not take the time of others who probably have something more definite in their minds to express than I have formulated on this subject. I always feel that a man learns something every time he attends any session of our society or any of its section meetings; and today I have learned what I didn't know before, namely, that pulmonary embolism heads the list of the postoperative lung complications. I had supposed when I came and before this paper was read that pneumonia headed the list. Of course, to a degree it is an academic matter as to whether or not embolism or broncho or lobar pneumonia are the chief complications which we should look out for. Nevertheless, the important practical thing that comes home I think to all of us is, How are we to prevent these distressing accidents of surgery?

I must confess that the older I grow and the more people I see operated upon, the more I dread to advise an operative procedure upon any person past middle life. The outcome is so uncertain. Now, the surgeon, of course, sees these cases every day. The busy surgeon is operating upon a very large number of them. It is only now and then that one patient dies out of many that pass through his hands. But I think the medical man is most forcibly impressed with the loss of the life in individuals where an operation is not an absolute necessity, but is one of choice.

I remember some years ago, and I shall never forget the incident, of a young woman coming into my office, apparently in very good health, complaining of considerable abdominal pain. I examined her and found that she had a small fibroid of the uterus. She was about thirty-eight years of age. The remainder of the examination was entirely negative. I said to her, "Well, I think you had better have that tumor removed. It probably will grow and subsequently will give you a good deal of trouble. It is now not bothering you much and you had better have it excised now while you are still a comparatively young woman." She demurred and said, "Well, Doctor, the pain is not bad; can't I get along very well without having it removed?" "Why, yes," I said, "perhaps you can. Possibly in later life it will degenerate and you won't have to have the operation, but the chances are that you will." She went home and on my advice subsequently had the operative procedure done. On the third day she died of lobar pneumonia.

Now, I have always thought of that case every time there

comes up a decision as to whether or not a patient shall be operated upon. What sort of advice must one give in these operations of choice? I feel that we should be extremely conservative. For the reason stated, I feel that every one of these patients before operation should first be looked over carefully from the standpoint that Dr. Richardson has mentioned: the heart, lungs, and kidneys, by a man who is not looking at the patient entirely from the surgical point of view. Nature deals very well with many supposedly operative lesions if they are left alone.

I am sure that many lives would be saved and many of these postoperative complications would not occur if more time were taken when these patients of a defective mechanism are placed in the hospital for operative procedure, if we could give them plenty of time to quiet down, rest up, re-establish their normal circulation, and, most of all, re-establish a higher natural resistance.

DR. MARY S. WHETSTONE, Minneapolis: When I was a student at Ann Arbor, Dr. McLain talked with a lady who came all the way from the state of New York who had a fibroid tumor of the uterus. She was in excellent health. He said, "Does it disturb you in any way apart from its large size?" "Nothing whatever," she answered. He advised her to go home and go about her business and not let anyone touch her as long as she was so well as that.

I remembered that when I became a physician and some fibroid cases came to me. I now think of four that were not so definite as that. They were in excellent health, no disturbances whatever, except one had a hemorrhage. She would not consent to an operation. She was near the menopause, and the hemorrhages later disappeared. They are all well and in good health the last I heard of them. Two I examined years later after the menopause. The tumors had disappeared.

DR. PAUL G. BOMAN (closing): It is impossible to go into the etiology of these conditions fully in a short presentation. I realize that in many of these complications it is very difficult to determine the exact etiology, but some of

the most important factors have been brought out. With regard to pulmonary embolism—and when we speak of embolism we don't refer here to the large emboli which usually cause immediate death, but to the small emboli which produce infarction—there is no question but that the circulation is of great importance. I think Wharton and Pierson bring this out very ably in their communication which was read before the American Medical Association two years ago. They classify infarction first of all as "incomplete infarction," which is produced in normal lungs, then "complete infarction," which takes place in lungs where there is pulmonary congestion and finally "fatal pulmonary embolism."

I think that the preoperative examination of the patient is by far the most important in the treatment of postoperative pulmonary complications. It is only when the surgeons will recognize this and will take sufficient time and care to examine their patients properly and to treat them properly that the morbidity and mortality are going to be decreased.

With regard to the statistics which Dr. Nippert referred to, the cases reported from the Peter Bent Brigham Hospital were all subjected to very careful preoperative examination, the statistics of Massachusetts were all previous to the influenza epidemic, and the statistics from St. Mary's were all after the influenza epidemic. So that I don't believe it is of any great importance with regard to these statistics or would make any great difference. We know that if a careful study is made of all postoperative reactions, the postoperative complication morbidity is going to be considerably higher than that which is reported in the average hospital and by the average surgeon. With regard to the nose and throat infections they undoubtedly play a very important rôle, and if I had had more time I would have mentioned them. I did have them listed under "infections."

I wish to thank Drs. Richardson, Keith, Head and the others for the very splendid discussions they have given my paper.

PROPHYLAXIS OF ENDEMIC GOITER

The prevention of simple goiter in endemic goiter regions by the administration of iodine tablets to school children and by the use of iodized salt is being extended year by year. Iodine tablets are given the school children of the following cities (and doubtless in other cities): Ithaca, North Tonawanda, Syracuse, Watertown and Cortland in New York State; Akron and Cleveland, Ohio, and Zurich, Switzerland. The health department of Michigan has co-operated with the state medical association, salt manufacturers and wholesale dealers, so that all table salts sold in Michigan contain small amounts of iodine. Many of the schools of West Virginia, Washington and Utah are applying this preventive measure under the state boards of health. Rochester, New York, iodizes the city water supply for one week twice yearly. The dangers and untoward effects from the use of iodine for the prevention of goiter are negligible; preventive work among school children should be carried out under medical supervision. The occasional appearance of "iodine hyperthyroidism" seems to be due to the use of large doses or to the con-

tinued use of iodine by a person over twenty with adenomatous goiter. A study of the literature does not reveal any report of a case due to the administration of iodine preparations in the schools according to the dosage recommended by Marine and Kimball.

(*Jour. A. M. A., June 13, p. 1858.*)

SENSITIZATION TO POLLEN

If a patient reacts to both giant ragweed (*Ambrosia trifida*) and common ragweed (*Ambrosia artemisiifolia*) the first conclusion might be that he is sensitive to both pollens. However, it would be best to make retests with varying dilutions of the two pollens to find out whether the patient is much more sensitive to one than to the other. If the patient reacts equally to the two pollens, he should be treated with an extract representing the two pollens. Treatment with one pollen would not protect him against sensitiveness to the other pollen, since pollen sensitization is highly specific.

(*Jour. A. M. A., June 27, 1925, p. 2022.*)

OBSERVATIONS ON DRY LABOR*

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Rupture of the amniotic sac prior to the onset of labor, or early in labor, is usually regarded as unfavorable to the normal progress of confinement. Such rupture removes the hydrostatic dilating wedge and throws the burden of opening the cervix on the presenting part of the babe, thus substituting a relatively unyielding object for the yielding bag of waters. The results of dry labor, as they concern the mother, are considered to be prolonged and painful labor, more extensive lacerations, and an increased liability to infection.

The reason for this early breaking of the fetal envelopes is not always apparent. We may assume that there is a variation in the strength of the membranes in different patients. Other factors, however, may contribute to this complication. Pelvic deformity, which will not permit of accurate fitting of the presenting part into the inlet, engagement of the occiput in the posterior half of the pelvis, and other anomalous presentations appear to be causes. In some instances the cervix seems to be responsible, particularly in the multipara with a scarred and chronically infected endocervix, when a low grade infection may have weakened the membranes just over the os. There is also the cervix that is long and conical, and apparently deficient in elastic tissue. Such a cervix at term is often not so well effaced and softened as the normal. It is possible that this condition acts to hold the presenting part out of the lower uterine segment. This allows the full pressure of the early contractions to be vented on that portion of the membranes immediately over the os, and thus produce their rupture.

Eighty-eight (12.5 per cent) of the last 700 obstetrical patients at the Mayo Clinic had premature or early rupture of the bag of waters. Fifty-six of the patients were primiparas, and thirty-two were multiparas. Rupture of the membranes occurred before the onset of labor in thirty-eight primiparas and in nineteen multiparas, and at the onset, or very early in labor, in nineteen primiparas and in thirteen multiparas. The time of rupture had no bearing on the subsequent course.

The occiput engaged in the anterior position in thirty-eight primiparas and in nineteen multiparas. There were five breech presentations, two in primiparas and three in multiparas, making a total of forty primiparas and twenty-two multiparas, of which twenty-six of the former and all of the latter delivered spontaneously.

Twenty-five babes engaged with the occiput posterior in sixteen primiparas and in nine multiparas. Two of the primiparas and eight of the multiparas delivered spontaneously. There was one shoulder presentation.

Thirteen primiparas and two multiparas had contracted pelves. Six of the former and one of the latter had spontaneous deliveries. These pelves were classified as nine simple flat; three with narrowed outlet; one generally contracted; one flat rachitic, and one with an immobile coccyx that impeded delivery.

Several women had abnormal cervixes and four developed edema of the cervix during labor.

The average length of time primiparas were in labor was seventeen hours, and multiparas, ten hours. The primiparas, with a primary anterior position, were in labor on the average thirteen and one-half hours, and those with a primary posterior position, twenty-six and one-half hours. Sixteen primiparas and five multiparas were in labor longer than twenty hours, in each instance with factors other than the dry labor to explain the long duration. Twenty-nine deliveries were made by forceps, sixteen median, and thirteen low operation. Seven median forceps deliveries were performed in connection with manual rotation for a posterior occiput; six were performed after spontaneous rotation of an occiput posterior. Three median forceps deliveries were made because of a long second stage in a primary anterior position. Of the thirteen low forceps deliveries, six were indicated to prevent threatened asphyxia of the babe and seven to terminate a protracted second stage.

There were nine vaginal lacerations and thirty-three episiotomies with repair. Three cervical lacerations required repair. Other cervixes may have been torn. However, in the absence of unexplainable bleeding with a well contracted fundus, it is best not to pull the cervix down and inspect it. Cervical tears, unless bleeding, are better not repaired until involution is complete.

There was no maternal mortality and the mor-

*Read before the Southern Minnesota Medical Association, Owatonna, May 18, 1925.

bidity was limited to one patient who developed phlebitis. She was admitted with an acute respiratory infection, however.

One abdominal cesarean section became necessary in a multipara. A contraction ring with threatened rupture of the uterus developed before there was sufficient dilatation for delivery through the vagina. The patient's recovery was uneventful.

The management of dry labor is worthy of some discussion. In case of premature or early rupture, a careful pelvic and abdominal examination should be made. If the findings are an ample pelvis, normal soft tissues and a babe presenting by breech or a well-flexed right or left anterior position of the occiput, little trouble need be expected. Detection of an atypical pelvis, a rigid or scarred cervix, or an unfavorable presentation, alters the case. Delivery in these cases would probably be difficult, even with an intact dilating bag.

Much depends on the care during the first stage. Absolute adherence to asepsis is even more important than when patients have intact membranes. Rectal examination and abdominal palpation will usually yield all the information necessary for the successful conduct of labor. However, should one be in doubt concerning the position or the progress of dilatation, a vaginal examination should be made. An occiput posterior should be diagnosed in the first stage of labor. Should the progress of these cases be unsatisfactory, correction may be anticipated early in the second stage.

The length of labor in most cases depends largely on the facility of cervical dilatation. In favorable cases of dry labor, little need be done save the usual first-stage measures. In unfavorable cases, however, much is gained by the use of morphin and magnesium sulphate solution injected into the muscle. This is usually given as $\frac{1}{6}$ grain of morphin sulphate dissolved in 2 c.c. of 25 per cent sterile and chemically pure magnesium sulphate. Occasionally, $\frac{1}{4}$ or $\frac{1}{8}$ grain dose of morphin is used. Injection deep into the muscle is necessary for complete and rapid absorption and to prevent slough which may occur with a superficial injection. The injection may be repeated two or three times during the labor; the usual result is a reasonably comfortable first stage of labor and, more important, a relaxation of the cervical tissues, which materially assists dilatation.

Dr. Gwathmey, in conjunction with the staff of the New York Lying-In Hospital, uses rectal anal-

gesia in obstetrics. This oil and ether mixture has proved valuable in their hands, and seems to lend itself particularly to the cases of complicated dry labor. I have tried it in a few cases with good results.

In an occasional case the cervix thins out well, but does not dilate even with good contractions. Digital stretching, carried to the elastic limit and avoiding laceration, may then be necessary. This procedure should not be confused with manual dilatation in the ordinary sense, as no attempt is made to complete the opening of the os. If a cervix remains dilated at 2 to 3 cm. with good uterine contractions, careful stretching will often hasten satisfactory progress. One stretching is, as a rule, sufficient; a second is rarely necessary.

Edema of the cervix is not uncommon; it occurred in four patients of this series. It is an unfortunate sequel, as a deep tear may result. Complete relaxation secured by $\frac{1}{4}$ grain of morphin is probably the best treatment. With a reduction in the severity of the pains, the circulation is re-established, the edema frequently disappears, and labor proceeds.

In the second stage of labor, the principal difficulty was in the management of occiput posterior positions and pelvic deformities. These two conditions are, of course, not peculiar to premature rupture of the membranes. Dry labor, however, is often a serious handicap when there is either a posterior occiput or an atypical pelvis. These two conditions are in themselves major problems. The pelvic deformity is a definite and more or less unalterable factor, unless it is sufficient to warrant cesarean section. The occiput posterior, on the other hand, can, as a rule, be corrected; it should be diagnosed early in labor and its progress watched closely. It is probable that most long, hard, dry labors are primarily due to an unrecognized posterior position of the occiput. Spontaneous rotation is to be expected in a fair proportion of cases. Manual correction with the hand whose palm encounters the occiput is successful many times, following which the course may be often left to nature. Forceps are often needed.

Failure of manual correction may be due to the impinging of the posterior shoulder on the promontory of the sacrum. In such cases, the so-called Pomeroy maneuver of carrying the hand up to the posterior shoulder and lifting it over the promontory is of value. This allows the occiput

to be rotated anteriorly without the twist of the shoulder to turn it back.

SUMMARY

Premature or early rupture of the bag of waters occurs in about 12.5 per cent of labors. The average length of labor is not increased because of this complication in itself.

Early rupture of the membranes should lead the physician to examine the patient carefully for any anomaly of the bony pelvis, soft tissues, or presentation of the babe. In case of a primiparous or multiparous woman in whom the bony pelvis

and soft parts are normal and the babe presenting by breech or a well-flexed occiput anterior position, little trouble need be feared.

The employment of morphin and 2 c.c. of 25 per cent solution of magnesium sulphate, injected well into the muscle, is of material assistance both in making the patient comfortable and facilitating the relaxation of the cervix. Colonic oil and ether analgesia may also be of value in this connection. Occiput posterior should be watched, since many long dry labors are no doubt due to the failure to recognize this condition.

APPARATUS FOR THE TRANSFERENCE OF PATIENTS*

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In a hospital where a large number of orthopedic patients require careful transportation on a Bradford frame, it was found convenient and almost necessary to use a so-called transfer truck. The apparatus is so constructed that it may be wheeled through the door of an ordinary hospital

the gear housing (E) controls the hooks which are attached to the four corners of the Bradford frame. The special gear at E is self-locking and so constructed that the elevation of the patient is always

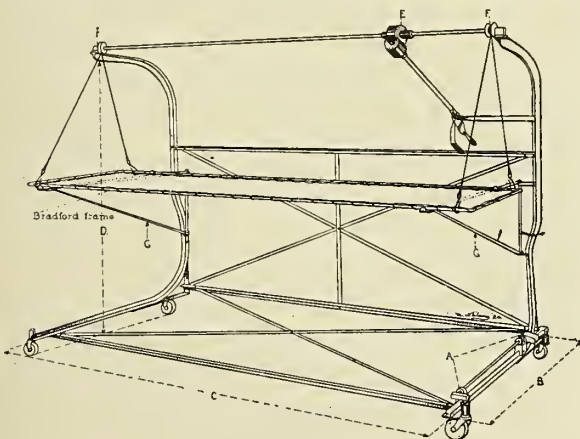
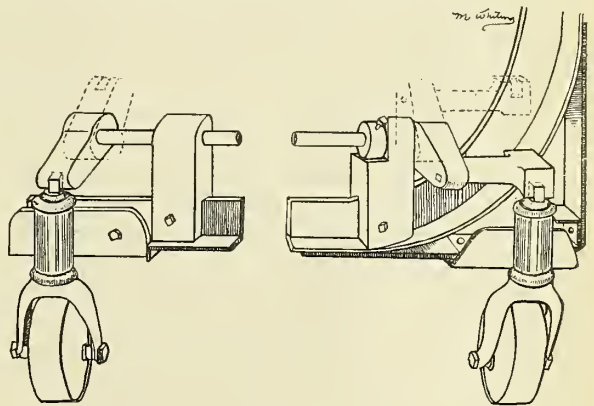


Figure 1.

room, and beneath the bed, the two arms (Fig. 1, F and F) extending over the patient lying on a Bradford frame. The handle working the shaft in



Detail of A.

Figure 2.

under control. After the patient is lifted from the bed by means of the elevating device, the truck is pulled out in the room and the arms (G and G) are turned under the Bradford frame. The patient can now be transferred wherever necessary. A locking device is applied to one set of trucks (Fig. 2) so they will travel straight ahead. The apparatus is so easily managed that one person can readily handle the patient. The measurements for the apparatus are: B, 4 inches narrower than the hospital door; C, 64 inches, and D, 60 inches. The material used is so-called $\frac{1}{4}$ " "T" iron for the main structure, braced with ordinary cold rolled iron. One-fourth inch steel cable is used as tackle.

*Submitted for publication February 26, 1925.

THE PROGRAM OF A TESTIMONIAL DINNER TO
DR. RICHARD OLDING BEARD
UNIVERSITY OF MINNESOTA
JUNE 12, 1925

Members of the Board of Regents of the University of Minnesota, the faculty of the Medical School, and a group of medical alumni and friends, tendered to Dr. Richard Olding Beard, who is retiring from active teaching service, with the close of the school year, a testimonial dinner at the Minneapolis Club on June 12, 1925.

The occasion was beautifully appointed in the large dining hall, which was filled with Dr. Beard's friends and associates, and among them many of his old students.

Dr. Lotus D. Coffman, President of the University of Minnesota, presided. At the close of the dinner, before introducing the speakers of the evening, President Coffman said:

It now becomes my very pleasant duty to preside at this meeting. I scarcely like to call it a meeting, because it is no ordinary assembly. I am sure it isn't a ceremony, because there isn't anyone to be married here tonight; and I have been conscious for the last half-hour that it isn't an obituary, for the honor guest of the evening is very much alive. He is as wide awake and intellectually as gifted as he ever was. We have several here who have known Dr. Beard in various capacities at the University far more intimately than I. They will be able to speak of his work and service here.

It has been my good fortune since I came to the state to have him aid me in making a partial survey of the University. He and his associates prepared such elaborate statistical reports that the Legislative Committee said, upon examining them, "What does it all mean, anyway?"

Since he has been connected with the University of Minnesota he has been one of the leaders of the movement for the consolidation of medical education at and in the University. He was one of those persons who recognized that after all medical education can only flower and come into its fruit in a University environment, and that if you are able to build a strong and influential medical school it will be partly because you have done the same thing for other departments of the University. When the various medical schools of the state were consolidated, Dr. Beard was one of those who insisted that they should be made a part of the University. Most of you know he has been prominent, too, in the movement for the advancement of nursing education. All in all, he has been a force of great influence; a leader who emphasized fundamentals and who saw far into the future.

It is a fine thing for one at the close of his labors in an institution to have a group of his friends assemble in this way to pay their respects to him.

As the first speaker of the evening, I have the honor to introduce Mr. Frederick B. Snyder, President of the Board of Regents.

President Snyder: Mr. Toastmaster, and most honored guest of the evening, ladies and gentlemen:

If I hesitate a bit in my talk tonight will you please attribute it to the fact that I have not come prepared to deliver any set speech. I preferred, rather, to come just as one of the friends of the honored guest, in order that

I might speak the little word I have to say direct from the heart, and leave it to his closer associates who are familiar with the great work he has done to tell you about that.

It is a great pleasure to be here tonight to express my appreciation of the work this good man has done, and to tell you that I personally have a regret in this, that, through no fault of his own, but just by reason of the passing of time, he has been obliged in a way to give up his work. You know, as we live and go along in life, we are apt to forget the passing of time, and that advancing years bring with them certain penalties. If the penalty should happen to be illness of mind or body, perhaps we may have been guilty of something in our past life which has brought upon us that penalty; but when a man goes through his life and expends upwards of thirty-seven years in a given cause, serving the state, and then wakes up one morning and is told, "You are penalized. The age limit has run against you; your salary must be cut, and your usefulness is not what it was yesterday"—that is pretty hard; because in the case of our honored guest, his eyes are as bright, and the grasp of his hand is as firm as it ever was. We shall hear from him tonight and I know his mind is as alert as it has been in all these years, and I know, too, that there is seated in his being that same imagination which has carried him forward all this time and is going to carry him still further along. I ask you, Dr. Beard, not to feel discouraged just because this time limit has been set down on you. Perhaps time will prove it to have been happily prearranged. While you have done many things in the upbuilding of the Medical School of the University of Minnesota, destined to carry your name forward when you are gone, it is safe to predict that the task you have undertaken since your retirement, to raise an endowment for the Medical School, will bear fruit not only in gifts while you are active, but long afterwards when wills and testaments are opened and reveal bequests and legacies which, without your efforts, would never have been made.

On behalf of the Board of Regents, I bring you greetings. The Board appreciates all you have done and wishes you God-speed in your new work.

President Coffman announced that Dr. William J. Mayo, who had expected to be present and to speak upon the occasion, had been detained in Rochester on account, doubtless, of the series of severe storms which had struck that city during the preceding two days.

He called next upon Dr. Elias P. Lyon, Dean of the Medical School, who spoke for the Administrative Board:

We have come together this evening to honor a man who has devoted his life to a human institution. A human institution is an interesting social and biological phenomenon. I say biological phenomenon, advisedly; for I think there can be no doubt that the origin of the human institution lies in the gregarious instinct which is a factor of survival,—an instinct displayed by ants and bees, by birds, by many mammals.

But the human institution is tremendously more complex than the community life of the lower forms. The human institution takes its purpose and character from the necessity of adjustments; but under the guidance of memory and consciousness it accomplishes a multitude of

complex adjustments which are entirely differentiated from the life of the brutes. Perhaps one would not be going too far in saying that it is the human institution which most of all distinguishes man from the lower orders.

Now, the first thing that strikes me about human institutions is that they may be divided into two classes. In the first class the selfish ideal,—the ideal of immediate advantage to the group concerned,—is predominant. You will think at once of many such organizations in society. In the second class, the altruistic ideal is dominant. In this second class are the school and all the organizations for social welfare.

I think it is much to say of a man that he has devoted his life to a human institution whose ideals are essentially altruistic. This is the primary glory of the educator and this is the primary honor we pay to Dr. Beard.

A human institution is said to have a life of its own. And this is because the analogy of the institution and of the organism is so fundamental. Often institutions live a very long time. But it is apparent that this life of the institution is really the combined lives of the component individuals that from time to time make up the institution; just as the life of the body is the co-ordinated and integrated activity of the individual cells, some of which are permanent, but many of which come and go, are born and die. The body goes on living, though many of its cells be changed from day to day. But some of the cells, as those of the nervous system, stay long and have a dominating influence in the body. So in the institution some men are very intimately and fundamentally related to its destiny. Such a man in this Medical School has been Dr. Beard. He has been a part of its brain, a part of its co-ordinating and planning mechanism, a part of the institutional consciousness. When such a man leaves it is like taking out a brain center. The loss can never be fully replaced. We do well to honor such a man.

Then there is a third thing that strikes me regarding human institutions. Though institutions grow, change, decay, and sometimes die,—nevertheless the trend, the scope, the impetus to this life is determined by those men who first organize and establish the institution. They are the germ cells, so to speak,—the biological determinants,—of institutional destiny. From them flow the hormones; from them proceed the invisible influences which make the institution, perhaps hundreds of years later, what it is to become. Witness the English Barons at Runnymede and the Magna Charta, witness the signers of the Declaration of Independence, and the founders of our Constitution. For good or bad, the course of an institution is set by its founders. It is a great honor to Dr. Beard that he is one of the founders of this Medical School which has accomplished so much and which appears to have such a large and useful future. Its high standards, its capital facilities, its excellent reputation, its large outlook and its plans for expansion, are largely the work of his hands and his brain.

I have worked for twelve years with Dr. Beard. We have not always agreed just as the thyroid and the adrenals do not always agree,—as the endocrinologists tell us. But we have adjusted and we have compromised and we have co-operated. And I can truthfully say that not one accomplishment, not one advance, not one plan of

these twelve years but has been largely influenced, shaped and invigorated by Dr. Beard.

Take our first task, a more liberal curriculum. Probably I am an educational radical, a pedagogic Bolshevik. Possibly Dr. Beard is a conservative. But he is never an obstructionist. He is a physiologist and he is willing to experiment. If we have had, as I believe we have had, for the past eleven years, a more stimulating curriculum, if we have furnished more scope for initiative and individuality than most schools, if we have been able to administer such a scheme more safely and soundly,—no small share of the praise should go to our esteemed colleague whom we honor here tonight.

Or take the graduate school of medicine. Dr. Clark Stewart perhaps furnished the germinal idea. When I came here the idea was sprouting. Dr. Moore was for it. Dr. Beard championed it. Dean Ford, Dr. Jackson and the rest of us gave it form and secured its right relations in the University. The giving of graduate degrees in clinical subjects is known as the Minnesota idea. It is one of the things we are proud of; and much credit for this achievement, as we look at it in retrospect, goes to him in whose honor we celebrate.

Or take the Mayo Foundation. In this case again the embryo idea was here when I came. There was division of opinion, which later became acrimonious. Dr. Beard was for it. He drew up the first papers; sketched the first definite picture, which formed the basis of discussion, criticism and betterment. He gave his heart to this cause. And whatever the Mayo Foundation may amount to now is to be set down in no small figures in the debt which the University of Minnesota owes to this undaunted champion.

And what does the Mayo Foundation amount to now? You may hold what opinion you will as to its immediate and demonstrable value to the Medical School. It did not work out as an adjunct or as a part of the undergraduate Medical School. The logic of events, the logic of Dr. Mayo's fundamental provision for the advanced education of doctors placed this great gift in the Graduate School. If we had foreseen this at the start it might have saved us from heartache. And now that it is accomplished and in the right way, no one who knows the facts can doubt that the Foundation adds distinction to the University of Minnesota; or that this distinction will grow as time goes on. For this distinction we add largely to our tribute to Dr. Beard.

Or take our further plans for the Medical School. Envisaged in the form of buildings, these plans contemplate the completion of Millard Hall and the Institute of Anatomy—two structures to the securing of funds for which and the erection of which Dr. Beard long ago devoted time and energy, and one of which bears within it everywhere the evidences of his activity. The plans involve further the increase of our hospital up to about 600 beds, with an appropriate outpatient building; and, further, a building for the School of Nursing for which our guest has already sweat, bled and died a good many times. When the Nurses' Building comes to be realized I suspect we shall find Dr. Beard's name engraved on every brick and stone, as "Calais" was engraved on Queen Mary's heart.

Now, on our planning committees from the earliest time, long before I came here, Dr. Beard has labored and his judgment and energy have been valuable.

There is another feature of our University relationships of which I should like to speak in this connection. There was a time when the Medical School stood aloof from the rest of the University. It took, one might almost say, a certain joy in being different; in being separate. When I came here I remarked that it almost seemed that there was a wall about the Medical Campus blocking it off from the rest of the University. All this has been changed. We are now amalgamated into the greater whole. Our programs interdigitate with those of the other colleges. Hundreds of students from other colleges take subjects in the Medical School and representatives of our departments sit on other faculties. We have come to realize the ideal that the Medical School is not an organization alone for the training of physicians, but rather is the custodian and reservoir of the Medical Sciences; the mechanism for supplying instruction in these sciences to all who desire such instruction either as the basis for a profession or as a part of a general education; and, finally, that the Medical School is the organization by which, through active research, these sciences may be forwarded and improved. I count this changed attitude of the Medical School as one of its finest achievements of the last ten years; and I gladly acknowledge the co-operation of Dr. Beard in this enterprise.

I might speak of other things—our technician's course, our public health nursing course, the embalmer's course and other activities—but I can say in a word that there has not been an undertaking of our faculty in which Dr. Beard's initiative and counsel have not been represented.

I have reserved for the last the School of Nursing. Dr. Beard has gained distinction as a leader in nursing education. Our nursing school stands high among such institutions. It is, as you know, the first Nursing School of University rank. There is not a feature of it, alike in its organization, curriculum and administration, that does not bear the impress of Dr. Beard's labors. The Central or combined school is a monument to him. When nursing education, the world over, becomes sound education rather than a cheap kind of trade-training founded on the exploitation of its apprentices, and when the history of this great monument is written down, Dr. Beard's name will appear as that of its pioneer and apostle,—like Horace Mann in Public School education or Mary Lyon in the education of women.

I have attempted to set forth the facts of our activities for twelve years and Dr. Beard's relation to these activities, without exaggeration or fulsome eulogy. His earnestness, honesty of purpose and ceaseless activity are admirable characteristics. His love of his work, his belief in our high mission as medical educators, his ardent advocacy of high standards and his loyalty to the University are high lights in a career of almost forty years in this institution.

I want to add one more thing which has stood out prominently in my experience with him. Like all men of strong opinions and ardent desires, Dr. Beard is a hard fighter. He maintains his position strongly to the last.

But when the vote is taken and the decision made, if it happens to be against him, he does not sulk in his tent. He is, above all, a co-operative man, a team-player. And that quality, all too rare among strong men, he has displayed over and over again in my relations with him.

We trust that he may long remain with us as a counselor and friend and that he may live to see the Medical School, whose small beginnings he witnessed and fostered, whose middle years he so largely helped to formulate and guide, become the great institution for good which his genius foresaw and his labors hastened. May he live in health, strength and happiness to see this consummation of his labors; and in that day, even as now, may he feel the acclaim of his thousands of students and his hosts of friends for one who honors and is honored by that choicest epithet: He was a teacher,—“A teacher of men!”

President Coffman then introduced Dr. Orville N. Meland, President of the Minnesota Medical Alumni, who responded on behalf of that Association:

Mr. Toastmaster, Dr. Beard, Ladies and Gentlemen:

One can hardly think of the Medical School without recalling its teachers. Of those teachers, one stands out prominently; not only because of his winning personality, but because of his untiring efforts in building up the School to what it is today.

We remember the time when the Department of Physiology consisted of two full-time men, Professor Beard and Professor Scott, and a part-time man, Dr. Russel Wilcox. Instruction was given in a large room which served as a laboratory, so filled up with desks and apparatus that it was almost impossible to turn around in it. Another small room was used as the office and storeroom. After two or more hours in the laboratory, we went to the amphitheater on the floor above, where we spent another hour on its uncomfortable straight-backed benches. Here it was that Dr. Beard lectured to us. He was always prompt. Stepping in briskly, he delivered a finished, very polished discourse on some physiologic subject, and then as promptly disappeared. Here was laid the foundation for our clinical medicine. Those days have changed. Today the Department of Physiology is housed in new buildings—it has a larger staff; but its supporting structure was built years ago by this man we revere.

Tonight we are honoring the passing of this man. He is severing his official connection with the University. He has accomplished great things and he can look back upon those accomplishments. To us he has not changed. He is a little bit older, a little grayer, but his eye is still keen. To us he is the same Dr. Beard.

Dr. Beard, I wish to extend to you the congratulations, the love and the appreciation of the Alumni. We wish you Godspeed. May your memories of the past be pleasant; may your dream of a greater Medical School become a reality.

President Coffman next introduced Dr. S. Marx White, who, as Chairman of the Committee of Arrangements for this testimonial occasion, spoke also on behalf of the Faculty.

Dr. White expressed his disappointment over the absence of Dr. William J. Mayo, from whom he read a telegram of regrets. He also read, in turn, telegrams or

letters received from absent friends who had been unable to attend. These included Dr. Walter E. List, Superintendent of the Minneapolis General Hospital; Dr. James T. Christison of the Department of Pediatrics; Dr. and Mrs. Leonard G. Rowntree and Dr. and Mrs. Harold E. Robertson, both men of the Mayo Foundation and formerly Chiefs of Departments in the Medical School; Dr. Ernest M. Hammes of the Division of Nervous and Mental Diseases; Dr. Charles Lyman Greene, formerly Chief of the Department of Medicine; Drs. W. Starr Judd, William F. Braasch and E. A. Meyerding, of the Mayo Clinic; Dr. Emil S. Geist of the Department of Surgery; Dr. John G. Cross, formerly of the Department of Medicine; Dr. Karl H. Van Norman, Superintendent of the Charles T. Miller Hospital.

Dr. White then spoke as follows:

Having taken an active part in the preparation of the delightful experience of tonight, and realizing that Dr. Beard is somewhat in the position of the sweet girl-graduate, in that he is stepping from one experience into another, as he will outline soon, I have to confess that I enjoy the rather unique distinction of having been here, as a member of the faculty of the University of Minnesota, longer, in point of time, than any other member of the Administrative Board of the School, excepting himself, although I am one more recently appointed to a position on that Board.

It happens that Dr. Beard and I graduated from the same institution, the Northwestern University Medical School,—he a number of years earlier than I. I did just what he did, came immediately from that institution to Minneapolis, and, like our honored guest, have had reasons only for felicitation and none for regret since.

From the time Dr. Beard came here he occupied a prominent place in the medical profession of this city. It was within a couple of years after his arrival here that one day, in a medical meeting, stimulated by the presentation of some clinical problem, he discussed this problem from the standpoint of the physiologist; and, on the following day, was visited first by a member of the faculty of the Minneapolis Hospital College and, on the day succeeding that, by a member of the St. Paul Medical College, each of whom offered him the Professorship of Physiology in his School. He could not accept both of these positions; and while he regrets, and probably will express this regret to the St. Paul members here tonight, his inability to accept the St. Paul position, yet, his acceptance of the Minneapolis post laid the foundation for a long and distinguished career in his special field. Out of these two Schools was born, in 1888, the Medical School of the University of Minnesota. Dr. Beard was one of its promoters; he was appointed to the Chair of Physiology; he remains the last member of its original faculty in active service.

Almost immediately after his acceptance of the position he was elected secretary of the faculty and has carried the duties of the secretaryship of the Medical School ever since with the exception of about four years. He has shown in that capacity, in addition to the many other abilities he possesses, a tremendous ability in administrative matters.

One of my earliest recollections of Dr. Beard, and this was in about 1899 or 1900, gives a sidelight on his character which you will appreciate. My honored chief at that time was Dr. Wesbrook, then Professor of Pathology and Bacteriology and later Dean of the Medical School. Dr. Wesbrook's appreciation of Dr. Beard expressed to me at that time has been very characteristic of the situation ever since. We had a building in which the laboratories of the Medical School were housed and a number of heads of departments were together there—Dr. Beard in Physiology, Dr. Lee in Anatomy and Dr. Wesbrook in Pathology and Bacteriology; and each was compelled to be always fighting for more room, more money, more help and more students. After a particularly interesting, amicable and productive discussion,—always short of physical violence,—Dr. Wesbrook said to me: "As you get more and more interested in the affairs of the Medical School, there is one thing you must do and one man you must keep your eye on all the time. Keep your eye on Beard. He will get everything there is to get and then some." That has been characteristic of our honored guest of the evening.

Following these earlier years, there has been a long period of very great activity for Dr. Beard. The Medical School of the University of Minnesota has been distinguished as being manned by a group with high ideals and great desires for the advancement of medical education. In all these years there has been no movement with which I have been personally acquainted which has not borne the impress of Dr. Beard's hand. He has had an active, effective and directing influence in all the advanced movements that have been made, and they are many. If the Medical School of the University of Minnesota stands in the front rank, it is because of the efforts and initiative and idealism of a group of men, such as he, who in spite of discouragement, in spite of the slowness of progress, have kept their ideals before them and have never swerved in their devotion to the school, to medical education and to the profession.

Now at this time of retirement from an active position in the faculty, a time which might be spoken of as somewhat of a graduation, it is interesting to note that this man whose energy has been so boundless, whose perseverance has been so great, and whose contributions have been so eminent, is planning, not a cessation of his labors, but a step forward to something that is even bigger and, we hope, something that will be even better than the things of the past.

The Committee on Endowment and Building Funds of the Medical School has had, as its head, Dr. Beard, and at this moment of laying down his teaching labors there appears to us to be an opportunity, unique, of which advantage should be taken. The Committee on Endowment and Building Funds has under way, with every prospect of success, a plan by which Dr. Beard's efforts in the upbuilding of the Medical School will continue his active participation in the work of the Committee, and I believe that the direction of his efforts will be even more effective, more pleasant, and more largely productive than in the past. I can state with confidence my belief that we shall be enabled to retain him in connection with this Committee, and we hope that he will continue in the relation

of general secretary at the heart of the work and will conduct the affairs of the organization in an effective and productive manner.

I am sure that when Dr. Beard rises to reply to the things that have been said to him and about him tonight, he will give us not a backward look, but a look into the future, and will outline his greater plans for the Medical School. I think, therefore, that it is a matter for felicitation, for thankfulness on the part of this group, rather than for regret, that Dr. Beard steps out now from one performance to another.

The toastmaster then called upon Miss Marion L. Vannier, Director of the School of Nursing, to speak on behalf of that unit. Miss Vannier said:

It is a pleasure to be able to express our very great appreciation of the service Dr. Beard has rendered to the cause of Nursing Education.

I feel that I am speaking not alone for the nurses of the University School, but for all nurses everywhere, when I say that he has our deepest gratitude and our enduring regard. Probably no other man is so well known to the nursing profession. His articles and published addresses on the subject of Nursing Education have been read and appreciated by thousands of nurses in this country and abroad;—in other words, Dr. Beard is an international figure in the nursing world and it is largely through his influence that the University of Minnesota School of Nursing has become so well and favorably known. Here, in the heart of the school and in that small group of interested teachers and administrators known as the executive committee, he has been a leading spirit. Ever since 1909, when the school was organized, he has served as secretary of this committee.

His faith in the value of educational ideals, his persistence and optimism in the face of difficulty, have been largely responsible for the life and growth of the school, and I am glad to announce that even though Dr. Beard is retiring from the faculty of the Medical School, he has agreed to continue his connection with the School of Nursing committee and I hope that during the coming years all of his ideals and ambitions for the school will be realized.

Even to the Nurses' Home! Dr. White says that Dr. Beard always gets what he goes after and we, therefore, hope that we may yet succeed. I was told when I came here, nine years ago, that a new Nurses' Home was soon to be built. We have not got it yet! But—we *have* Dr. Beard!

The President then introduced Dr. J. C. Litzberg, who spoke on behalf of the Committee on Arrangements of the evening, as follows:

President Coffman, Dr. Beard, Mr. Snyder, Ladies and Gentlemen: I wish I had the eloquence to express what is in my heart. I wish I were as well fitted in my command of the English language, as I am in my knowledge of Dr. Beard, to say what I desire to say on this occasion.

As Dean Lyon was talking, I thought I would have to make a correction of his use of the terms Bolshevik and Conservative. You know there is a party, in between,

called the Progressive, and I would put Dr. Beard in that category.

He began his career in the Medical School somewhere around the age of 32. At 38 he was advocating the addition of a year to the three-year medical course. At 48 he was insisting upon a two-year college preparation. At 58 he was promoting fellowships for graduate students. At 68 he has the same vision for medical education that he had at 38, 48 and 58. Dr. Beard "retired" is an impossible conception. You couldn't make him stop working if you tried.

In order that our gratitude to you, Dr. Beard, might be put into words and into something of a permanent form, all of these friends have asked that an appreciation be presented to you on this occasion of your retirement from active teaching. This is an appreciation, written by loving hearts, and I may add that it was made by an artist with loving hands. When I asked the Medical School Art Shop to do this, the head of the Art Shop asked that she might do it herself, because of her long association with you and her admiration of you and your work. It gives me great pleasure to present to you this illuminated "appreciation" in behalf of your friends and admirers here assembled. It is signed by the President of the Board of Regents, the President of the University, the Dean of the Medical School, the President of the Alumni Association of the Medical School and the Director of the School of Nursing, and affixed to it is the official seal of the University of Minnesota.

President Coffman, in introducing the guest of the evening, said:

We are proud of our Medical School, just as we are proud of our University. We have made great progress in the development of the University and its various units in recent years. As far as the Medical School is concerned, this progress has been due largely to the splendid gifts which the institution has received, rather than to any large increase in state support. The hospital facilities of the University of Minnesota are almost entirely the result of gifts. The Elliot gift of 1907 started the movement. Since then, there have been other gifts, many of them small, to be sure. Mrs. Todd, Mrs. Gale and Mrs. Mapes presented the University with the sum of \$45,000, which was supplemented by \$110,000 of University funds, which enabled the University to build an eye, ear, nose and throat hospital. Mr. William Henry Eustis gave in money and in property to the amount of \$1,500,000 for a children's hospital, a children's convalescent home and their endowment.

It is a fine thing for persons of private means to co-operate with the state in the building of a Medical School where young men and young women may study the science of medicine and nursing. If this movement continues, there is no reason why we should not have built here at the University of Minnesota as great a medical center as can be found anywhere in the world. This dream can be realized only by the co-operation of private and public capital.

Even with the gifts that have already been made, we shall still fall short of what we should accomplish. In addition to these, of course, there is the gift of the Gen-

eral Education Board of \$1,250,000, which, when matched by \$2,350,000, will make a total of \$3,600,000 for the further development of medical education. As yet we have been unable to match the General Education Board gift. We are still hoping that means may be found to accomplish this purpose.

Proud as we are of our Medical School, its achievements, aims and purposes, we must still dedicate ourselves to the task of continuing its development if it is to be on a par with the leading medical schools of this country, and if it is to serve the people of this region as it should.

I am sure that in his response to the greetings of the evening, our guest, whom it is my pleasure to call upon, will bring us a message which looks to the larger future of the school.

Dr. Richard Olding Beard, in response to the addresses presented, said:

It is difficult to find words to express my grateful appreciation of the goodness and the friendship that have prompted you in arranging this occasion for me tonight. That it is nothing new in my experience of you only serves to quicken my feeling. This same sense of your friendship, this same assurance of your esteem, has been mine for these many years.

I am glad that you have adopted the comely fashion, growing comelier as it becomes more customary, of not waiting until "the pitcher is broken at the fountain" before you attempt to measure its carrying capacity, to evaluate the service it has rendered, to note the human need it has sufficed, in its way, to meet; that instead you take such an opportunity as this to assure one of your kindly sense of the work he has done or tried to do, before he shall have reached the goal, to which we all move, when he would not perchance hear your assurances and could not feel the handclasp of those who wish him well.

It has been one of my rather unique duties, in the doing of which I have taken a strange satisfaction, to have written a memorial, on behalf of the faculty, of each one of its members who has passed away since the very beginning of the school. The performance of that duty has been the more possible because of my intimate knowledge of the character and the sterling service of the men with whom I have worked; but, nevertheless, in the doing of it, I have often thought that we might better have written the memorial, better have spoken the words of it, put them into print that the recipient might have read them, before he passed on.

Years ago, one day, I walked into the office of our dear old President Northrop to have him say to me—"Beard, I want you to write for the coming exercises (incident to the death of the first Dean of the School), a memorial to Dr. Perry H. Millard." It was the first of the sadly long series of these tributes I have since undertaken, and I demurred, for there had been occasions of conflict between this militant Dean of the early day and his equally militant secretary. "But," said the peace-loving Prexy, "you know the man and his virtues and his achievements better than anyone else knows them. That you and he have not always agreed should make your testimonial to him all the more telling." I wrote, and I have always been glad to

have written, that memorial to a really remarkable personality. There was much of power in the character of this man who organized the Medical School of the University of Minnesota. I have never re-read that memorial without a satisfying appreciation of the request of Dr. Northrop.

Years afterwards, the old President said to me again, "There is something I want you to do for me. If I should go on into the other world before you do and should there be any occasion to write a memorial of me, I want you to write it." And it is one of the rewarding events in my life that when he *had* passed on I was asked to represent the faculty of the University in laying this last tribute at the feet of the Grand Old Man of Minnesota. No duty could have conferred upon its doer any higher honor. And yet after I had written it and seen it in print, I wondered, again and again, to myself, if we might not far oftener have assured him of our love and loyalty while he yet lived. My thoughts went back to old Thomas Carlyle and his mournful cry as he stood by the grave of the wife he had lost, "I loved thee, Jeanie, but I would that oftener I had told thee so."

So, yet more fully and with deeper gratitude, I appreciate the kindly things that have been said of me and of my service to the Medical School of Minnesota tonight. I shall carry the memory of them with me always. I appreciate particularly the beautiful thought that has placed these sentiments, so beautifully expressed, into this permanent form.

When my friends approached me regarding the program of the evening it was suggested that I attempt some reminiscences, but I said that I would rather not. The past is of value only so far as it is funded into the present,—into the character of the men who have made the present what it is. Reminiscences always suggest something of regret and, personally, I have none. I want to assure President Snyder that in reaching my retiring age, in giving up my active membership in the faculty of the University, I am not in any wise unhappy. I have nothing but satisfaction in the thought of the work I have done in the development of the Medical School, for it has been the love of my life. In thus coming to the time when I may be relieved of my teaching and executive duties I anticipate something of a sense of freedom. For forty years I have taught physiology and there are younger men, doubtless, who can do it now better than I. I shall enjoy an occasional opportunity still to lecture, perhaps to larger and more mature groups and upon chosen themes.

I have no idea that retirement for me means quitting. I am not going to quit. I expect to go on in the service of the Medical School and to enjoy the chance to choose my own form of work. As one of the immediate opportunities I am more than pleased to accept the continued direction of the work of the Committee on Endowment and Building Funds. I am delighted to have so able, so representative a body of men and women to work with me and I am sure that work we will.

I should not have declined the invitation to talk reminiscences to you tonight, I should not have taken up this forward-looking task, if I had not had vision to see and faith to believe that this Medical School of ours has a large future. This occasion gives me an opportunity to

leave with you a message,—an opportunity I may not so fittingly find at another time. It is a message which I may hope will leave some permanent impress upon your minds.

Abraham Flexner, in 1910, placed the Medical School of Minnesota in the front rank of the teaching institutions of the United States. If we are to keep it there it must be by a quick appreciation of the need to maintain its actual and its relative growth among other leading schools. If it is to take its place in coming years as the medical center which, geographically and educationally, it should take in the Northwest, it is well that we permit no grass to grow under our feet. It behooves the Board of Regents, the faculty, the alumni and an interested and beneficently-minded public to be up and doing. The people at large do not discharge their debt to modern medical science, in the matter of preventive as well as curative medicine, by the mere payment of professional fees when they are ill.

We enjoy, at the present moment, a fine vantage ground of support already gained or offered to us. We should not allow the failure of any individual or any public body to delay our acceptance of these offers or to thwart the development of the school's logical future.

It rests with the Board of Regents to determine methods of procedure; but the Medical School is, I believe, a unit in the belief that a readjustment of the offer of the General Education Board should be sought at the earliest possible moment, to the end that its two distinct problems,—the one of Medical School and University Hospital expansion,—the other of the future location of the Minneapolis General Hospital,—may be separately worked out and each without prejudice to the other. So we may be given the impetus to do our part toward our self-development,—may be set free to work out our own salvation. And it can be worked out.

Whether or not the next legislature rises to its opportunity to aid in this development, the way can be found in this Northwest, as it is being found elsewhere, to meet the needs of medical progress. Never has there been so great an awakening of the American people to the value of human health as there is today; never has the interest of a beneficently-minded public in the promotion of medical education and research been so keen. Minnesota will prove no exception in meeting the rise of this tide of sympathy in the cause of health protection when her occasion for assistance comes.

What is necessary to make Minnesota a great medical school? True, something more than mere brick and stone masonry, fundamental as this physical expansion is. Six hundred hospital beds on the Campus, the completion of the two medical laboratory buildings, a nurses' hall, are physical necessities, but they will constitute only the shell into which the living kernel of our great growth is to be planted.

I remember well that when the committee of the Medical School appointed to work out the details of needed physical expansion reported to President Coffman, over a year ago, he said, "And now, gentlemen, you should be thinking about the question of maintenance, of support." The Committee on Endowment is the answer of the Medical School

to that challenge. It proposes to help to answer that question.

Medical education, keeping pace with the growth of medical science, has become a necessarily expensive thing. Medical research is the essential stepping-stone to effective medical teaching, and it, too, costs money.

A state-supported school cannot compete in these days with generously endowed institutions of medicine without something more than state appropriations.

It needs the larger revenue that will provide an adequate teaching staff, at adequate compensation, to command the highest order of ability.

It needs endowed chairs, particularly in the clinical branches, to permit the employment of full-time teachers at suitable salary.

It needs an equipment of modern type, perennially renewed to meet the improvements of the day, for the effective study of the human subject and the effective prevention, diagnosis and treatment of disease.

It needs an annual income for the upkeep of its library in the recognized classics and the current literature of the day.

It needs a fund for the foundation and support of a University Medical Press and the promotion of original authorship.

It needs a generous provision for teaching fellowships in number equal to its capacity to give to graduates abundant clinical material for study with unlimited opportunity of laboratory investigation, and to fulfill the need for this desirable type of assistant teaching.

It needs the means to extend to the profession of medicine, at large, ample opportunity in the renewable values of graduate study.

It needs endowment for the promotion of research alike in the fundamental medical sciences and in the constantly multiplying problems of preventive and remedial medicine.

These are the things that make for a great medical school and these are the things for which, in full measure, state support cannot provide. These are the things which, buildings aside, invite the beneficence of the lover of his kind. Their recital should kindle the imagination of teachers and students, alumni and professions,—incite their interest in an evolution in which they all may share and in the attainment of which they all may lend a hand.

Not only has the Committee on Endowments and Building Funds prepared and distributed to the alumni in the past few months and is now distributing to the medical profession, literature descriptive of the school's need and the giver's opportunity, but it has initiated the endowment fund with a subscription by the graduating class of June, 1925, to the first unit share of one thousand dollars. The generous action of the "boys" should serve as a stimulus to their colleagues in the profession and among the alumni. It is very interesting, at this juncture, to note the recent offer of the medical alumni association to assist in securing endowment for the school.

There are none of us who will deny the obligation of the school to its alumni. Of equal force is the obligation of the alumni to the school. I am convinced that it will

benefit both if in the near future the alumni may have a substantial stake in the endowment of their Alma Mater, as they should have a substantial share in the guidance of its policies.

I cannot look into a large future for the Medical School in which the medical profession of the state does not play its part. There are few of us but deplore any past occasion of difference with its members. The school needs their cordial support. It hardly seems just that differences of judgment upon past events should alienate their interest or deny to the school their encouragement and support. I plead with you all that for your part and through your influence with your professional associates you seek to level the barriers which any such differences have raised. Let us ask the profession to forget dissension and to abate criticism; to get together and to think together and to think greatly in behalf of the school.

With a natural union of the naturally allied forces of the faculty, alumni and profession, there need be no limit to the natural growth of the school, to the spread of its influence, to the realization of the values it may render to the public "whose we are and whom we serve."

With the faith and the affection I hold and have held in the Medical School, from its beginning to the present day, I can see a large vision of its future and the future of medical education in Minnesota for which we have long hoped and waited, a vision that has sustained us through years of difficulty and doubt and disappointment and sustains us yet. A born optimist, I love to look into the horoscope of its future and find there something to work for still.

I see a school of sufficient capacity, its laboratories adequately manned and equipped, its clinical material abundant to its teaching needs, opening wide its doors to every properly prepared and fitly selected student who would enter. I would tenaciously cling in such a school to the principle of intelligent selection of the human material which may fitly be educated by the state to serve the state in preventive and remedial medicine.

I see an equipment of hospital services, suitably endowed for the investigation of the causes of disease and the methods of their prevention; for the application of modern science upon the ever advancing crest of its progress to the diagnosis, the treatment and cure of disease. I see this hospital of the future the most effective mechanism for the restoration of the sick to health and to economic efficiency.

I see a medical library and a medical literature in the Minnesota school, complete and accessible, that will contribute its quota of funded influence to the education of graduate and undergraduate students alike; that will yield its gathered stores of literary wealth to the promotion of research; that will invite the use by the profession of a circulating system; that will serve to extend the knowledge of the people at large in the things that belong unto their health. I see the time when the University will take up the task of sending suitable information to the public, in the interest of the public health and in substitution of the miserable husks of knowledge fed to it by the lay and the pseudo-medical press.

I see the Minnesota School making its large perennial contribution to the sum and the progress of medical science.

I see the widening of the limitless field of preventive medicine and public health, with physicians and public health nurses working hand in hand for the bettering and the building of better human bodies and the development of better human minds.

I see a medical and hospital campus around which a group of associated public and private hospitals will cluster, which will draw their resources of library, laboratory and nursing service from the institution's abundant stores.

I see the creation of an Institute of the Medical Sciences, grouping, under its administrative direction, the Medical School and the Colleges of Dentistry and Pharmacy, the School of Nursing, the School of Public Health and the special courses which prepare for the technical services of them all.

I see a medical school, again, of so high ideals, and so generous proportions, that it will attract great teachers and draw great scholars, and train, in turn, great educators and scientific investigators and clinical leaders who will mold the movement of their time in modern medicine.

I see a school whose graduates will be of so initial fitness, of so cultural preparation, of so thorough professional training that the University may fitly and unquestioningly set its seal upon them as a guaranty to the public that the health of mind and body, the issues of life and death, may be safely entrusted to their guiding hand.

I see a profession, born of such a school, that shall rise above the strifes and jealousies of other days, that shall no longer tolerate mediocrity and commercialism in its midst, that shall rise to the full conception of its obligation of service, that shall awaken to that sense of social consciousness which will compel the full exercise of its educational functions for the benefit of the great mass of mankind, that will inspire and justify the public trust, that will make it the natural instigator and promoter of every measure for the public good.

May these things be in Minnesota!

In his closing comment upon Dr. Beard's address, President Coffman said:

Some people grow wiser as they grow older; some just grow older. We have had two persons at the University of Minnesota who apparently grew wiser as they grew older. I refer to Dr. Nachtrieb and Dr. Beard, both of whom are present here this evening.

Ever since these men became members of the staff of the University of Minnesota, they have insisted that laboratories are as essential to the development of science as books are to the humanities. It has always been easy for the people of the state to appreciate this fundamental truth. This last year, when we were discussing our biennial estimates with certain representatives of the Legislature, after I had drawn a picture of the kinds of people whom we should have upon the faculty, the salaries which we should pay such persons, and of the laboratories, facilities and equipment which we should supply for them, one member of the Legislature said, "Mr. Coffman, why do

you need all these hospitals in connection with the Medical School? Cannot medicine, that is, all of medicine that is necessary, be taught from textbooks?" It seems clear that we still have a long distance to travel before we have fully educated the public to appreciate the picture which Dr. Beard has drawn.

As I said earlier in the evening, if we are able to induce persons of private means to co-operate with us so that the University of Minnesota receives gifts in amounts similar to those which Yale, Johns Hopkins, Western Reserve, the University of Chicago, and Leland Stanford receive for medical education, these gifts to be used to supplement the funds which the state is now devoting to the development of medical education, we can then have a school here which is unequaled among the schools of the world.

We should set our minds and hearts to the task of having not a second-rate school, but of having the best school that can possibly be made.

Now, as we close, let me say that a generous share of Dr. Beard's achievements can be attributed to the comradeship and assistance of his wife. May we hope that he may have the comfort and guidance, the assistance and co-operation of this wise helper by his side for many years to come.

It seems as if the pleasures of the evening would not be complete unless each had an opportunity to express his wishes to these good people. I therefore suggest that Dr. and Mrs. Beard stand at the door so that we may, as we go out, wish for them a long life, filled with abundant happiness and untold opportunity for continued usefulness.

MEDICAL SCHOOL PROVIDES AN INTIMATE CONTACT OF EDUCATION WITH COMMUNITY LIFE

The University of Minnesota, faculty and students, recently had the pleasure of hearing an address by the chairman of the American Medical Association's council on medical education, Dr. Arthur Dean Bevan. He spoke with authority at the cornerstone laying of the Todd Memorial and George Chase Christian Memorial hospitals when he said: "The truth is that in forty years a revolution has occurred. A new and great science, the science of medicine, has been born. This change has been so rapid and so great that even those of us who are in active work can reach back and touch the dark days when medicine was not a science."

"President Coffman and the regents and faculty of the University of Minnesota, I desire to congratulate you and the people of Minnesota upon the splendid development that is going on in your medical school. I desire especially to congratulate you upon the fine buildings which you are beginning to erect today. They will be centers of medical teaching and medical research of the best type. I have had the pleasure of inspecting your medical school and I believe that you have the opportunity of developing here one of the great medical schools of the world.

"Build your school on such broad lines that it will belong not to the University alone, but to all the people of your state. Conduct it so that it will not only train general practitioners of medicine, specialists, and research men, but so that it will secure for the people of your state the best of preventive and curative medicine. Seek to master the great unsolved problems of the cause, the prevention, and cure of disease so that from your laboratories and clinics there will come great medical truths that will prove of service to all mankind."

The development of a medical school makes a university a part of the statewide community in a way that nothing else can do, he told his audience. But, he warned, hospitals must not be built and conducted with teaching as their sole or primary function.

"It is an economic wrong," said Dr. Bevan, "for a university to conduct a hospital for the sole purpose of teach-

ing and research, and a sociological crime for a municipality to conduct a hospital as a boarding house for the care of the sick without regard for the educational and research functions of the hospital. From the interests of the community, therefore, this union of forces is demanded. We must bring about as soon as possible these affiliations between our universities and our great hospitals which are so situated that they can secure the advantages of university connections.

"The best investment that any state can make," he said elsewhere in the address, "is money given for the adequate support of education and of medicine. There will always remain the great privilege and great opportunity for private endowment to assist medical education, medical research, and medical charities. It is interesting to note that the great endowments of Rockefeller and Carnegie, founded for the general benefits of mankind, have turned more and more to medicine as the surest way of accomplishing their fundamental purpose.

"The taking over of the medical school by the university has brought to the presidents and trustees of our universities a large and complex problem. Medicine has become such an important part of modern life that it touches every man, woman and child in the community, and when a university develops a medical department it at once assumes through that medical department a function which brings it for the first time in its history into the everyday life of the people. The medical school cannot be developed along the narrower lines of some departments of the university. The medical school drags the university into the practical, every-day life of the people through its hospitals, dispensaries and public health work, its maternity work, infant welfare work, its care of the blind and deaf and crippled children, and its nurses' training schools. It influences not only the patients of these institutions but the people who manage and support them, and also the medical profession. This marriage of the university and of medicine can be productive of great good if both parties to the contract learn to do their part. The development of a medical school along the best lines will be a fine thing for the university. It will have a broadening effect. It will make the university a part of the community in a way that nothing else could do."—Minnesota Chats, Vol. 3, No. 54.

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION,
SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN
MINNESOTA MEDICAL ASSOCIATION, AND MINNE-
APOLIS SURGICAL SOCIETY

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its

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All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of \$1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VIII	AUGUST, 1925	No. 8
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EDITORIAL

Twelve-hour Hospital Nursing

The disposition of the nurses' hours is a proposition which should be solved by the nurses themselves. The public, the hospitals and, to a lesser degree, physicians, are, however, interested in the solution.

The recent decision of the nurses and hospitals in the fourth district of the Nurses State Association to substitute the twelve-hour shift for private nursing in hospitals (the change does not affect nursing in the home) for the customary twenty-four-hour shift is a step in keeping with the general trend throughout the country. The twelve-hour shift, however, has decided disadvantages as well as advantages.

The change became effective July 1 in all hospitals in the fourth district of the Nurses Association, which includes the counties of Isanti, Chisago, Anoka, Ramsey, Washington, Dakota, Scott, Rice and Goodhue. The step was not taken hastily. There had been some talk of such a change for several

years. Hospital authorities have felt that the contemplated change should properly come from the nurses' organization. Eventually a committee of the Private Duty Section of the nurses of the fourth district was appointed to investigate the matter and letters were written to the principal hospitals throughout the country. It was found that except for a small north-central district of this country, which includes Minnesota, the twelve-hour day had become very general and not a single hospital expressed the desire to return to the former schedule.

The Private Duty Section heard the committee report and voted to recommend the change to the Board of Directors of the Association. The Board met the hospital superintendents and the superintendents of nurses of many of the hospitals in the fourth district and an agreement to make the change was reached. Later, those hospitals not represented at this meeting joined in.

The public has no means of organized expression of their reaction to such a step. The phase they are likely to see first is the expense of two nurses under the new system instead of one. In certain instances the already heavy expense of sickness in hospitals is undoubtedly going to be even greater and, in our opinion, unnecessarily so where little attention at nighttime aside from the mere presence of a nurse in case of emergency is needed. Floor care, which is a form of so-called community nursing, will have to improve considerably to justify the new arrangement.

On the other hand, a patient requiring the active services of a nurse at night should not, and, as a rule, does not, expect the private nurse to be on duty all day and all night.

Under the new scheme patients will receive more attention during waking hours and the hospitals will assume more responsibility for night care in all but the seriously sick. Serious sickness is an emergency which will still have to be met by strenuous though expensive measures.

From the hospital standpoint the fact that the new system has proved so generally satisfactory is significant. The hospitals feel they can handle their responsibility better by not dividing their responsibility at night with a sleeping nurse and during daytime with an absent nurse. It does seem as though the expense of hospital administration may increase somewhat with the necessity for

more floor nurses. Whether hospitals will have fewer patients remains to be seen.

The twelve-hour schedule has been in effect before this in numerous hospitals throughout the state, including the University, Minneapolis General, Swedish and Eitel hospitals in Minneapolis.

The nurses' standpoint is fully as important as any other. A working day from 7 A. M. to 7 P. M. is a long one in any vocation, and we doubt whether the change will prove a relief to the nurse. To be at work at 7 A. M. in the morning means early rising and by 7 in the evening little energy is likely to be left for evening relaxation. Provision has been made for some time off in the afternoon after two weeks of continuous service with a patient. No sunlight hours off duty, however, is bad as a steady diet. On the other hand, most lectures, concerts and entertainments come in the evening and have been generally denied the private duty nurse.

One phase of the old system which had much to do with the desire for the twelve-hour hospital duty was the necessity of the nurse being on duty in a kimona. Sleeping in the same room with a patient is often not best for either patient or nurse. With the twelve-hour system it, too, becomes easier to control the troublesome afternoon visitor, who often undoes much of the improvement in the patient's morale built up by the nurse.

Personally, we feel that the private duty nurses have been poorly advised. If in the nurses' place we would much prefer the old system or at least some leeway as to choice in individual cases. We venture to predict that the change will drive an even larger percentage of nurses out of private duty into the less arduous spheres open to the trained nurse.

Let George Do It

The communication which immediately follows in this number of MINNESOTA MEDICINE expresses sentiments with which most of us agree. The suggestion is made that "much more might be accomplished by the profession in cleaning up its own ranks than by seeking repressive legislation against quacks or irregulars." Both activities are important.

Justice in legislative demands is no guarantee of success. The individual members of the legislative committees have to be shown the justice of

a proposal and must be shown in a certain way. The malpractice act is a good example. When it was brought up in the legislature four years ago it died in committee. Personal contact in addition to justice of the cause was what accomplished the result this year.

As to cleaning up our own ranks, that is a perpetual need which will doubtless always exist. Whose duty it is to correct abuses in medical practice in general is a matter about which there exists a very general misunderstanding.

The secretary of the Minnesota State Medical Association frequently receives communications about the presence of quacks in a certain locality and the query whether something cannot be done about it. The State Association has never assumed the responsibility nor provided the necessary personnel for seeking out violators of medical practice laws and prosecuting them. That is not its function nor is it in particular that of local county societies. The organized profession has jurisdiction over its own members only and should, it is true, keep its skirts clean.

Members of county societies share with other citizens responsibility for the state of medical practice in their locality. It is the duty of the local county attorney to prosecute offenders, but someone must submit the necessary evidence of the guilt of a practitioner or quack in order to obtain even a trial. The natural dislike of trial publicity leads too often to withdrawal of testimony and defeats justice.

Misunderstanding exists as to the functions of the Minnesota State Board of Medical Examiners. Its duty is to license Doctors of Medicine and revoke licenses upon submission of proper evidence. It passes on educational and moral qualifications and may revoke a license only after proper hearing of evidence of immoral, dishonorable or unprofessional conduct, the accused having the right to appear with his attorney before the Board and appeal to a higher court if he so desires. The Board acts as a court and has neither the means nor personnel to act as a police body to enforce medical practice laws.

Further, when testimony is submitted to the Board it must be conclusive. The word of a single individual as to the conduct of a physician is not in itself sufficient. One or more witnesses are indispensable. And just and fortunate is such

provision, else any one of us might at any time have his license revoked upon the statement of one unscrupulous individual.

The experience of the Board in attempting to assist in prosecuting violators of medical practice is frequently disheartening. A number of times when assisting in a prosecution the grand jury has refused to return a true bill upon presentation of evidence apparently sufficient at least to start a trial. For instance, in certain parts of the state midwifery has been practiced by unlicensed individuals for years. Efforts to control this situation and convict offenders have proved futile in some instances by the presence on the jury of a farmer's wife who had been attended by the accused. In like manner juries have refused to convict unlicensed practitioners although the defendant has admitted practicing without a license. The minimum penalty for a misdemeanor of this kind, being a fine of \$50 or ten days' imprisonment, scarcely serves as much of a deterrent. A jury is as a rule loath to take away an individual's livelihood unless he is shown to be distinctly harmful. The fact remains in medical practice as in other lines that if a locality does not wish to enforce a law, the law is not going to be enforced.

The physician along with other citizens carries the responsibility of bringing offenders to time. And this in spite of the fact that the physician's motives are likely to be misconstrued. The layman, however, is the one most wronged by dishonest or incompetent medical practice and his insistence on his legal right of redress will do much to prevent such practices whether on the part of the licensed or unlicensed practitioner.

COMMUNICATIONS

900 Nicollet Ave., July 10, 1925.

The Editor of MINNESOTA MEDICINE:

I have been reading the transactions of the House of Delegates with much interest. It seems that through the efforts of Dr. Herman Johnson, who left his practice for four months, which he devoted to the Legislature, and, at an expense of two thousand dollars, a time limit of two years instead of six for the filing of malpractice charges was secured. That was a fine result, but it was a result that ought to have been accomplished at less cost of time and money. No legislator who was not a crook could have denied the justice of such a demand on the part of the profession. The delegates seemed to have the faith

that sufficient time and money spent in dining and educating members of later legislatures will be effective in securing the demands of the medical profession for further advances in medical reform. I have serious doubts. Twenty-five or thirty years ago, when the Osteopathic Bill was put through the Legislature, a brilliant young graduate of my own college practicing law in northern Minnesota was one of its sponsors. I wrote to him and expressed my surprise and disappointment. He defended himself with the usual arguments of what he had seen accomplished by osteopathy. One of the senators who had opposed the bill told me that he had been offered money to help put the bill through. It's notorious that the irregulars of all kinds and their friends of the Medical Freedom sort are willing to spend large amounts to corrupt legislatures, and I don't believe the medical profession can compete successfully with them. The prejudice of the average legislator against the profession is not altogether baseless. The wisdom and virtue enshrined in the regular profession is only one side of the story, and I share with other men the impression that much more might be accomplished by the profession in cleaning up its own ranks than by seeking repressive legislation against quacks or irregulars. Over a year ago I sent to the Minnesota Board of Medical Examiners full details of the swindling of a simple-minded man by a crooked doctor. So far as I am aware no notice was taken of the facts.

We have laws enough on the statute books now to give abundance of opportunity to clean up many abuses in the state of Minnesota, some of them in our own ranks, but we have apparently lacked necessary interest or have simply been content to "let George do it."

Very truly yours,

EDWARD J. BROWN.

POLIOMYELITIS OUTBREAK

Minneapolis, Minn., July 20, 1925.

To the Editor:

Dr. A. J. Chesley, Executive Officer, said that you would like to have some information concerning the poliomyelitis outbreak in southeastern Minnesota. The attached sheet gives the incidence of poliomyelitis cases to date as reported during June and July. Southern Minnesota has reported nearly all of the cases. Twenty-eight of the 49 cases reported during June and July have come from Winona County. Seventeen of the Winona County cases have been reported from Winona City.

Only two deaths have been thus far reported. The local physicians estimate that to every case of poliomyelitis there are 20 to 25 cases of acute illness which present symptoms simulating the early symptoms of poliomyelitis but which recover after a few days' illness without any apparent muscular impairment.

The cases in the southeastern part of the state have been investigated by our epidemiologists, and in almost every case they find a history of exposure to a known case or to some person who had a transient acute illness without paralysis.

Under date of July 10 the Wisconsin State Board of Health reported that a few cases of poliomyelitis had de-

veloped in Trempealeau and Buffalo Counties (Wisconsin), along the Mississippi north of La Crosse, and on July 15 the Wisconsin State Board of Health reported two cases at Alma, Wisconsin, and two at La Crosse. We have since received report through other sources of 14 cases in Galesville, Wisconsin.

Very truly,
O. McDANIEL,
Director.

POLIOMYELITIS

Anoka County—	
Anoka City	1
Blue Earth County—	
Mankato City	3
Vernon Center Village.....	1
Carver County—	
Hollywood Township	6
Watertown Township	3
Fillmore County—	
Harmony Village	2
Hennepin County—	
Minneapolis City	1
Roseau County—	
Roseau Village	1
Scott County—	
Belle Plaine Borough.....	1
Stevens County—	
Chokio Village	1
Wabasha County--	
Wabasha City	1
Winona County—	
Rollingstone Township	1
St. Charles Village.....	3
Winona City	17*
Mt. Vernon Township.....	2
Norton Township	1
Utica Township	1
Whitewater Township	1
Wilson Township	2
Total	49

*Two deaths.

Minnesota State Board of Health Regulations for poliomyelitis require:

1. Immediate report by telephone or telegraph "collect" to Division of Preventable Diseases, of all recognized or suspected cases.
2. Isolation of patient in screened room for 2 to 3 weeks from onset.
3. Collection of patient's nose, throat, and mouth discharges on cloths, to be burned at once.
4. Disinfection of bowel and bladder discharges.
5. Private funeral and terminal disinfection if death occurs.
6. Children in the house, and persons associated with the patient, shall be kept under observation for two weeks after last exposure and during this period must not attend any public, private or parochial church or Sunday school, or any public or private gathering whatever.

NOTE.—Do not overlook danger from convalescents and "carriers."

7. Dogs, cats and other household pets must be kept out of house.

NOTE.—Abortive cases of poliomyelitis are dangerous and should be isolated under the same precautions as paralyzed cases.

Whenever poliomyelitis prevails in a locality the local board of health shall cause a search for, and a careful examination of, all ill children to be made and all children with fever shall be isolated pending the diagnosis.

NOTE.—The most effective agency in the control of poliomyelitis is the employment of public health nurses who, in co-operation with the physician, will teach sick-room precautions, the necessity for rest in bed, and the need of proper support for affected parts.

An epidemiologist is sent to make lumbar puncture, administer serum, trace source of infection, if possible, and to advise local health officer relative to control measures, upon receipt of report of a case or suspected case of poliomyelitis or cerebrospinal meningitis. Early lumbar puncture is of the greatest importance in both diseases.

Outfits for collection of spinal fluid specimens for laboratory examination are furnished free of charge upon request by the Division of Preventable Diseases, State Board of Health, University Campus, Minneapolis.

PRECAUTIONS TO BE TAKEN IF ACUTE POLIOMYELITIS
(INFANTILE PARALYSIS) OR EPIDEMIC MEN-
INGITIS IS PRESENT

To prevent spread of these diseases and thereby avoid sickness, suffering and death, observe the following:

1. Keep your children off from the streets.
2. Do not let them play with any children or associate with adults who are not entirely well.
3. Keep them as quiet as possible and be sure they get a full amount of rest and sleep.
4. Keep your house properly screened and swat every fly that gets inside.
5. Keep sick persons who do not belong in your house out of your house.
6. Be careful as to what goes into the mouth: (a) Wash children's hands frequently; (b) cultivate the habit of keeping fingers and things not to be eaten out of the mouth.
7. Be careful as to food: (a) Make sure that hands are washed thoroughly just before eating; (b) avoid eating uncooked foods and vegetables that have been handled by unknown persons or that have been exposed to street dust or to flies; (c) make sure that all fruit consumed is ripe and not over-ripe or decayed.
8. Use individual drinking cups and do not use your cup for a dipper or a dipper for a cup.

IN CASE OF SICKNESS

1. If one of the children or an adult in your family appears sick or complains of not feeling well, separate

that person from the rest of the family and call a doctor at once. Do not allow any visitors to enter your house.

2. After waiting upon the sick person be sure to wash your hands immediately and again before eating or preparing food for others.

3. Collect nose and throat discharges in paper napkins or in small pieces of old cloth and burn immediately.

4. Bowel and bladder discharges must be disinfected before depositing them in a sewer or cesspool or elsewhere. To disinfect stools use 5 per cent formalin solution, or 5 per cent carbolic acid solution or such other disinfectant as your physician or health officer shall advise. Always use as much of the disinfectant solution as there is of the discharges to be disinfected.

5. Obey directions of your doctor and your health officer.

REMEMBER!

1. One-fifth of all persons sick with poliomyelitis die and many who survive remain more or less disabled throughout their lifetime.

2. Three-fourths of all cases occur in children under ten years of age.

3. When the disease occurs in adults, death claims about one-half of the cases.

4. It pays to be careful, first as to the children, secondly as to the grownups.

OBITUARY

DR. E. O'B. FRELIGH

The community of Stillwater was shocked Sunday night when it was learned that Dr. Edgar O'Brien Freligh died suddenly at his home. Death was attributed to heart disease.

Dr. Freligh was born in Ottawa, province of Ontario, Canada, February 23, 1857, being a few months past 68 years old at the time of his death.

He was united in marriage with Nina Berwick Rennie, of Montreal, November 10, 1886, and in 1887 they came to Stillwater, where they have since resided.

Dr. Freligh was a communicant of Ascension Episcopal Church, and was a member of the Knights of Pythias, Elks No. 179, and Eagle lodges. He was the physician for the latter organization. He was president of the Washington County Medical Society at the time of his death.

When a young man, Dr. Freligh graduated from the college of pharmacy at McGill University, Montreal, Canada. Later the degree of Doctor of Medicine was bestowed upon him by his alma mater.

Dr. Freligh is survived by the widow; one daughter, Mrs. C. E. Doran, Stillwater; two sons, Dr. W. Proto Freligh, Albert Lea, Minn., and Harold E. Freligh, of St. Paul; three sisters, Mrs. S. A. Huntington, Vancouver, B. C., Mrs. William Henderson, Boston, Mass., and Mrs. A. W. Howell, Montreal, Canada.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Northern Minnesota Medical Association will be held this year, Monday and Tuesday, August 24 and 25, at Brainerd, Minnesota. The morning sessions will be devoted to clinical work, with the presentation of scientific papers occupying the afternoon sessions.

A banquet will be given the guests of the Association Monday evening at 7 o'clock at Breezy Point. A program of musical numbers and dancing will follow.

The following program has been arranged:

MONDAY MORNING, AUGUST 24TH

CLINICAL PROGRAM

8:00 A. M. to 8:40 A. M.

Eye, Ear, Nose and Throat Clinic

Dr. C. G. Nordin, Brainerd

Dr. N. H. Gillespie, Duluth

8:40 A. M. to 9:20 A. M.

Neurological and Mental Clinic

Dr. W. S. Patterson, Fergus Falls

Dr. Joseph Nicholson, Brainerd

9:20 A. M. to 10:00 A. M.

Surgical Clinic

Demonstration of Operated Fracture Cases

Dr. J. A. Thabes, Brainerd

10:00 A. M.

General Clinic

Dr. J. B. Derauf, Brainerd

Dr. A. W. Ide and staff, St. Paul

MONDAY AFTERNOON, AUGUST 24TH

SCIENTIFIC PROGRAM

1. Surgery in the home with some interesting surgical reports.....Dr. R. G. Christie, Long Prairie
2. Some phases of renal diagnosis and the classifications of renal diseases from the medical standpoint.....Dr. F. J. Hirschboeck, Duluth
3. Chronic backache: Some applications of orthopedic knowledge to the problems involved in relief from a common disorder.....

Dr. J. R. Kuth, Duluth

4. Colon irritability.....Dr. E. L. Gardner, Minneapolis
5. Diabetes in private practice.....

Dr. Fred H. Stangl, St. Cloud

6. The treatment of unilateral pulmonary tuberculosis with associated empyema.....

Dr. Carl A. Hedblom, Madison, Wis.

7. The value of X-ray as a therapeutic agent.....

Dr. A. U. Desjardins, Rochester

8. The management of sinusitis in children.....

Dr. Roy A. Barlow, Madison, Wis.

MONDAY EVENING, AUGUST 24TH

7 o'clock

Annual Banquet at Breezy Point

President's Address—Dr. E. L. Tuohy, Duluth

TUESDAY MORNING, AUGUST 25TH

CLINICAL PROGRAM

8:00 A. M. to 8:40 A. M.

Pediatric Clinic

Dr. M. P. Gerber, Brainerd

Dr. O. W. Rowe, Duluth

8:40 A. M. to 9:20 A. M.

Genito-Urinary Clinic

Dr. Gilbert Thomas, Minneapolis

Dr. R. A. Beise, Brainerd

9:20 A. M. to 10:00 A. M.

Special Clinic

Dr. Carl Hedblom, Madison, Wis.

10:00 A. M. to 10:40 A. M.

General Clinic

Involving Roentgen Presentations

Dr. M. J. Kern, St. Cloud, Minn.

Dr. J. C. McMillan, Winnipeg

10:40 A. M. to 12 A. M.

Clinic on Diabetes

Dr. Russell M. Wilder, Mayo Clinic, Rochester

Dr. Fred Stangl, St. Cloud

TUESDAY AFTERNOON, AUGUST 25TH

SCIENTIFIC PROGRAM

1. Inguinal hernias.....Dr. George Earl, St. Paul
2. The value of history taking in general disease, and gastro-intestinal disease particularly.....
Dr. George B. Eusterman, Rochester
3. The radiological findings in some of the more common diseases of the colon.....
Dr. J. C. McMillan, Winnipeg
4. Peripheral vascular changes in disease.....
Dr. G. H. Brown, Rochester
5. Diathermia in general practice.....
Dr. O. V. Johnson, Sebeka
6. Fractures.....Dr. C. W. More, Eveleth
7. The fundamental principles involved in successful cancer surgery..Dr. Wm. A. Ground, Superior, Wis.
8. Mercurochrome in acute infections of the central nervous system.....Dr. W. H. Hengstler, St. Paul

WABASHA COUNTY MEDICAL SOCIETY

At the fifty-seventh annual meeting of the Wabasha County Medical Society, held in Plainview, Minnesota, Thursday, July 9, 1925, the following officers were elected for the coming year: President, Dr. D. S. Fleischhauer, Wabasha; vice-president, Dr. E. A. French, Plainview; secretary-treasurer, Dr. W. F. Wilson, Lake City. Dr. E. H. Bayley, Lake City, was elected as delegate to the State Association meeting, with Dr. H. E. Bowers, Lake City, as alternate.

Committees appointed included a Public Health Committee, consisting of Drs. H. E. Bowers, Lake City; E. H. Bayley, Lake City, and D. P. Dempsey, Kellogg, and a Committee on Legislation, composed of the following members: Drs. J. A. Slocumb, Plainview; D. S. Fleischhauer, Wabasha, and E. H. Bayley, Lake City.

A dinner and social hour preceded the scientific program, which was opened with the president's address, "Medical Co-operation," by Dr. H. E. Bowers, at 2 o'clock. Other

numbers included an address by Dr. E. A. Meyerding, St. Paul, secretary of the State Medical Association, on "Insurance and Other Medical Economic Problems," and a paper entitled "Some of the Newer Developments in the Cancer Field," presented by Dr. William C. McCarty, of the Mayo Clinic staff, Rochester, Minn.

Senator James A. Carley, who was an invited guest at the meeting, was given an ovation on the stand he took in regard to legislative matters in the last session of the State Senate. He responded with an appreciation of the manner in which legislative matters were handled by the members of the medical profession.

On motion, the society instructed its secretary to write a letter of appreciation to senators and representatives from the district, thanking them for their stand regarding medical legislation during the last session of the legislature.

The society voted to hold the next regular meeting at Wabasha in July, 1926.

AMERICAN ELECTROTHERAPEUTIC ASSOCIATION

The American Electrotherapeutic Association will hold its 35th Annual Session September 15 to 18 at the Hotel Drake, Chicago, Ill. Papers will be read by the leading men in the field of physical therapeutics and by invited guests of national reputation. A demonstration of actual technic of application of the various physical modalities will be given. There will be a complete exhibit of the latest electrotherapeutic apparatus and accessories. All legally licensed physicians are welcome and detailed program can be obtained by addressing Dr. Richard Kovacs, Secretary, 223 East 68th Street, New York City.

OF GENERAL INTEREST

Dr. F. C. Schuldt, St. Paul, who has been abroad for two months, has returned home.

Dr. Albert Fritsche, of New Ulm, is spending a six weeks' vacation in our western states and in western Canada.

Dr. and Mrs. Theo. Hammermeister, of New Ulm, have returned from a camping and fishing trip in northern Minnesota.

Dr. E. R. Jellison, formerly of New Auburn, has opened offices in the Walker Building, Minneapolis, for the practice of medicine.

Dr. and Mrs. F. P. Strathern, of St. Peter, left July 17 for a three weeks' trip to Denver, Salt Lake City and Yellowstone Park.

Dr. and Mrs. Charles H. Mayo, who have been abroad, returned home by motor from New York, where they were joined by their sons, Charles Mayo, Jr., and Joseph Mayo.

Dr. George T. Baskett, assistant superintendent of the State Hospital at St. Peter, together with Mrs. Baskett, has returned from a trip to Big Timber, Montana, and Yellowstone Park.

Dr. I. E. Bowing has withdrawn from the partnership of Stangl, Bowing and Stangl, at St. Cloud, Minnesota,

and removed to Port Washington, Wisconsin, where he has located for the practice of his profession.

Dr. Charles A. Lapierre, of Minneapolis, accompanied by his wife and daughter, Ada, is making a three months' tour of Europe and will return the latter part of September. Dr. Arthur Lapierre and Dr. Jean Lapierre, sons of Dr. Lapierre, have taken over their father's practice in his absence.

An examination was held by the American Board of Otolaryngology on May 26, 1925, at the Medico-Chirurgical Hospital, Philadelphia. The next examination will be held at the University of Illinois School of Medicine on October 19, 1925. Applications may be secured from the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

Dr. K. H. Van Norman, of St. Paul, has accepted the directorship of a group of three hospitals located on the campus of Western Reserve University, Cleveland, Ohio. Dr. Van Norman will leave his present position as superintendent of the Charles T. Miller Memorial hospital and the Wilder Dispensary within the next three months to assume his duties in Cleveland.

Five fellowships in neuropsychiatry have been established in the Graduate School of Medicine of the University of Pennsylvania by the Commonwealth Fund of New York. The courses begin October 12, 1925, and are for three years, one year being devoted to fundamental work, one to practical and one to investigation. The yearly stipend will amount to about \$2,200.00 per annum. Applications should be addressed to the Dean of the Graduate School of Medicine, University of Pennsylvania, Philadelphia.

The former Nurses' Home at 577 Oakland Ave., St. Paul, has been converted into a convalescent home for women and is being operated by the Junior League of St. Paul, whose members guarantee its financial support for one year in advance.

The house accommodates twelve patients and has been redecorated with a view to providing the atmosphere of cheerfulness, comfort and quiet most conducive to speedy convalescence.

A registered nurse is in charge of the home, assisted by an advisory board whose chairman is a physician. There is a competent cook and the need for additional service is regulated by the number of patients.

The rates are nominal: seven dollars a week for double room and twelve dollars for room alone, including meals. Meals will be served in the rooms if desired for an additional charge of ten cents a meal.

Forty members of the Ramsey County Medical Society, which has endorsed the home, have made use of its facilities. Among the patients have been heart cases whose home conditions were unsatisfactory, cataract cases awaiting operation, "worn-out mothers" who need rest, cases recovering from operation no longer in need of hospital care, but not yet able to take up their regular duties.

The house is always open for inspection and information may be had over the telephone (Elkhurst 4076) from Miss Durkee, who is in charge, or through the Junior League member who is on duty at the home each afternoon.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

AMERICAN CHEMICAL LABORATORIES:

Rhus Tox. Antigen (Strickler)

Rhus Venenata Antigen (Strickler)

BRITT, LOEFFLER & WEIL:

Loeflund's Malt Extract With Calcium

Loeflund's Malt Extract With Cod Liver Oil

LEDERLE ANTITOXIN LABORATORIES:

Scarlet Fever Streptococcus Antitoxin (Unconcentrated)

WM. S. MERRELL Co.:

Pituitary Extract (Obstetrical)-Merrell

Pituitary Extract (Surgical)-Merrell

H. K. MULFORD Co.

Lamb's Quarters Pollen Extract-Mulford Treatment Sets.

Scarlatinal Antitoxin (Unconcentrated)-Mulford

PARKE, DAVIS & Co.:

Tuna Fish Protein Diagnostic-P. D. & Co.

FREDERICK STEARNS & Co.:

Insulin-Stearns, 80 Units, 5 c.c.

Insulin-Stearns, 80 Units, 10 c.c.

WINTHROP CHEMICAL Co.:

Solarson

TRUTH ABOUT MEDICINES

NEW AND NON-OFFICIAL REMEDIES

Poison Ivy Extract-Lederle (In Almond Oil).—A solution in almond oil of a substance extracted from the fresh leaves of poison ivy (*Rhus toxicodendron*). The preparation is used to desensitize persons against poisoning with *Rhus toxicodendron* and to relieve the symptoms of the dermatitis produced by contact with the plant. It is injected intramuscularly. The preparation is supplied in syringes containing 1 c.c. Lederle Antitoxin Laboratories, New York.

Pollens Dried-Mulford.—The dried pollen of various species of plants. Pollens dried-Mulford are intended for diagnosis only (Allergic Protein Preparations, New and Non-official Remedies, 1925, p. 273). A small amount of the dried pollen is rubbed into an abrasion of the skin to which has been applied a drop of physiological solution of sodium chloride or of tenth-normal sodium hydroxide solution. An urticarial wheal appearing within a half hour from the time of application indicates a sensitiveness to the particular pollen used. Pollens dried-Mulford are marketed in packages of one capillary tube containing a sterile needle and sufficient pollen for one test; in packages of six capillary tubes and in vials containing 0.05 gm. of pollen.

Typhoid Vaccine-P. D. & Co. (New and Non-official Remedies, 1925, p. 363).—This is also marketed in packages of thirty ampules, ten containing 500 million and twenty containing 1,000 million killed typhoid bacilli each. Parke, Davis & Co., Detroit.

Typhoid Paratyphoid Vaccine-P. D. & Co. (New and Non-official Remedies, 1925, p. 363).—This is also mar-

keted in packages of thirty ampules, ten containing 500 million killed typhoid bacilli, 375 million killed paratyphoid A and 375 million killed paratyphoid B bacilli, and twenty containing 1,000 million killed typhoid bacilli, 750 million killed paratyphoid A and 750 million killed paratyphoid B bacilli. Parke, Davis & Co., Detroit. (Jour. A. M. A., June 13, 1925, p. 1825.)

Stovarsol — *Acetylaminohydroxyphenylarsonic Acid*.—Stovarsol contains from 27.1 to 27.4 per cent of arsenic. Stovarsol has been reported to produce favorable effects in the treatment of amebic dysentery. It is claimed to yield satisfactory results both in the eradication of dysenteric cysts and encysted flagellates and for general amebic dysentery. Stovarsol is not proposed for the treatment of syphilis and its use in amebic infections is still in the experimental stage. Stovarsol is supplied in tablets containing 0.25 gm. Powers-Weightman-Rosengarten Co., Philadelphia.

Insulin-Mulford.—A brand of insulin (New and Non-official Remedies, 1925, p. 171). Insulin-Mulford is supplied in the following forms: Insulin-Mulford is supplied in the following forms: Insulin-Mulford 20 units, 5 c.c.; Insulin-Mulford 40 units, 5 c.c. H. K. Mulford Co., Philadelphia (Jour. A. M. A., June 20, 1925, p. 1917).

Rhus Tox. Antigen (Strickler).—A solution of a substance extracted from the fresh leaves of *Rhus toxicodendron*. *Rhus Tox. Antigen (Strickler)* is used to determine sensitiveness to *Rhus toxicodendron*, to desensitize persons against poisoning with *Rhus toxicodendron*, and to relieve the symptoms of the dermatitis produced through contact with the plant. *Rhus Tox. Antigen (Strickler)* is supplied in packages of four 1 c.c. vials for use in prophylaxis and treatment and as *Rhus Tox. Dermal Test* in packages of a 1 c.c. vial (accompanied by a vial of *Rhus venenata* germ test) for use in determining sensitiveness. American Chemical Laboratories, Philadelphia.

Rhus Venenata Antigen (Strickler).—A solution of a substance extracted from the fresh leaves of *Rhus venenata*. *Rhus Venenata Antigen (Strickler)* is used to determine sensitiveness to *Rhus venenata*, to desensitize persons against poisoning with *Rhus venenata*, and to relieve the symptoms of the dermatitis produced through contact with the plant. *Rhus venenata antigen (Strickler)* is supplied in packages of four 1 c.c. vials for use in prophylaxis and treatment, and as *Rhus venenata dermal test* in packages of a 1 c.c. vial (accompanied by a vial of *Rhus Tox. Dermal Test*) for use in determining sensitiveness. American Chemical Laboratories, Philadelphia. (Jour. A. M. A., June 27, 1925, p. 2003.)

PREVENTIVE TREATMENT FOR RABIES

The Harris Pasteur Treatment for rabies can be given and kept on hand by the physician and is reliable. New and Non-official Remedies, 1925, lists the antirabic vaccine of a number of manufacturers which is sent out in packages of seven, fourteen and twenty-one doses. Recently the Council on Pharmacy and Chemistry has announced the acceptance of antirabic vaccine of this class marketed by the H. K. Mulford Co., the Cutter Laboratory and the Lederle Antitoxin Laboratories.

(Jour. A. M. A., June 27, 1925, p. 2022.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of April 15, 1925

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 15, 1925, at 8 o'clock. The meeting was called to order by the President, Dr. H. P. Ritchie. There were 40 members and 4 visitors present.

The minutes of the March meeting were read and approved.

The Secretary read a letter from the Minnesota Historical Society acknowledging receipt of the old minute books of the Academy which have been placed in their vault for safe-keeping.

Dr. R. O. Beard was elected to honorary membership in the Academy.

DR. OSCAR OWRE reported a case of nephroma of the kidney.

DR. GEO. DOUGLAS HEAD reported the following case of Carcinoma of the Stomach Simulating Ulcer of the Stomach or Duodenum. (Specimen shown.)

Cancer of the stomach is rarely associated at its onset with an acute hemorrhage from the stomach and bowels. The case I wish to report began with a sudden emesis of a large quantity of blood and also the passage of bloody stools. In its history and clinical findings it simulated an ulcer of the stomach or duodenum. This was the early diagnosis made. The subsequent development of a mass in the body of the stomach raised the question of cancer. The presence of a perforation in the center of the growth in the hard scirrhus part of the mass suggested strongly carcinoma superimposed upon an ulcer base.

Mr. O. J. O., 61 years, married, children, traveling salesman. Has been a healthy man all his life aside from some stomach trouble off and on which has bothered him for the last twenty years. On November 16, 1924, while on a trip to North Dakota, he was suddenly seized with nausea and vomited up a large quantity of blood, a wash-basin full. He also had a number of black, tarry stools. On the day following the large hemorrhage, he vomited again a quantity of blood, he thinks about a cupful. After the hemorrhage he felt very weak and exhausted. He was seen by a physician who told him he had a duodenal ulcer and kept him in bed with an ice bag over his upper abdomen and on starvation for four or five days, after which he was allowed to return home, where I examined him on December 4, 1924.

The examination revealed a tall, thin, extremely anemic-looking man, weak and exhausted from hemorrhage. He was complaining of some discomfort in the upper abdomen, but the examination disclosed no tenderness. No mass could be felt, no enlarged lymph glands. The entire examination was negative, outside of a dark brown stool containing occult blood, and the blood findings of a high-grade secondary anemia. Hemoglobin, 42 per cent; R.B.C., 2,696,000; color index, .89; W.B.C., 14,250. Differential leucocyte count: P.M.N., 84.5; Lymph., 8.0; L.Mono., 3.5; Trans., 2.5; Eosin, 1.0; Baso., 0.0; Myelocytes, 0.5. No

poikilocytosis, no anisocytosis, no polychromatophilia. No x-ray or gastric studies were done on account of the patient's condition.

A diagnosis of gastric or duodenal ulcer was made and the patient put upon a rest cure for ulcer, with the alkaline treatment and liquid foods. He had very little discomfort, the color of the stools gradually lightened, and his illness pursued the regular course, except that the stools always contained a small amount of occult blood. After he had been in bed and under treatment for six weeks, I began to allow him semi-solid food. He then commenced to complain of pain in the left upper abdomen close to the left costal margin and, on palpation in this area, a small mass, the size of a pullet's egg, was palpated. It was movable, descended on inspiration and was clearly in the great curvature of the stomach. Only two interpretations of the mass could with reasonableness be made, i.e., an ulcer in the greater curvature with dense adhesions and perigastritis, and a carcinoma of the greater curvature.

The gastric distress increased, the mass became larger and more tender, and on March 30, 1925, Dr. George Eitel opened the abdomen and found a sharply circumscribed carcinoma the size of an orange in the greater curvature of the stomach, without metastases, but with dense adhesions to the transverse colon.

The mass with a part of the stomach wall was excised, together with a portion of the transverse colon. The patient lived four days following the operation. (Exhibits specimen.)

You will note the scirrhus type of the growth, in the center of which there is a small perforation. Inasmuch as the perforation is in a hard portion of the mass, the question is raised whether this case is an illustration of a carcinoma superimposed upon an ulcer. This occurs in about 8 to 10 per cent of carcinomata of the stomach. The history of a long gastric ailment over years, with a sudden severe hemorrhage, and the course which the case pursued strengthens this interpretation of this condition.

DISCUSSION

DR. ABBOTT: Was there carcinoma in the whole area?

DR. HEAD: I do not know. A piece was cut out near the periphery and sent over to the University. This is the first case of carcinoma of the stomach which I have observed in which the onset of symptoms was ushered in by severe hemorrhage from the stomach and bowels.

DR. JUDD: This certainly is a very interesting case and illustrates very well the type of case we see which starts with an ulcer of the stomach and when it comes to operation is found to be malignant. The question of whether or not it was malignant in the first place is pretty hard to settle. This case certainly suggests that it was an ulcer at the start.

DR. HEAD: There is another point of interest I might add. This man lived about four days after the resection was done. On the fourth day it was thought advisable to give 200 c.c. of 1 per cent glucose solution intravenously. After about 100 c.c. of glucose had been put in the vein he was given one unit of insulin by order of the attending

surgeon. Of course, the patient was hypoglycemic because of his long starvation. Immediately after this man had been given the one unit of insulin he developed a very severe chill lasting a number of hours, with marked restlessness and symptoms of shock. He showed all the evidences of the presence of an extreme state of hypoglycemia, from which he did not rally. The patient's condition was not good at the time the glucose and insulin were given. I do not think the giving of this small amount of insulin had any effect upon the outcome.

DR. W. F. BRAASCH reported a case of cystic degeneration in hydronephrosis.

DR. F. R. WRIGHT gave a review of Lichtenstein's Monograph on "Gonad Therapy."

DR. HEAD: The question arises in the minds of a good many of us as to just how long the effects of this transplantation of gland remain?

DR. WRIGHT: The case mentioned was eight years, but he says that when this operation is done on animals they will remain for an indefinite period, or throughout the animal's life. This man was twenty-nine years old when operated and thirty-seven when the report was made.

In the absence of Dr. H. L. Taylor, Dr. E. K. Geer of St. Paul gave a short talk and showed a moving picture, in four reels, of the development of "Pulmonary Tuberculosis." This picture was prepared by Dr. Louis Gregory Cole of New York City.

The meeting adjourned.

JOHN E. HYNES, M.D.,
Secretary.

Meeting of May 13, 1925

The Minnesota Academy of Medicine held its regular monthly meeting at the Town and Country Club on Wednesday evening, May 13, 1925, at 8 o'clock. In the absence of the President and Vice President, the meeting was called to order by Dr. J. T. Christison. There were 47 members and 1 visitor present.

The minutes of the April meeting were read and approved.

DR. CARL B. DRAKE (St. Paul) reported the following case of Hemochromatosis.

The patient is a male, aged 47, whom I first observed at the Ancker Hospital two years ago. At that time he was complaining of a loss of some eighteen pounds of weight during the preceding seven months, marked weakness for a year, and a mass in the right abdomen which he had noticed a month before and which seemed to be rapidly enlarging. His attention had been called a month previous to a marked change in the color of his face and hands. He had been perfectly well up to a year previous to his admission to the hospital, at which time he noticed dizziness and lassitude.

Born in Poland, he came to this country at the age of six. He had had measles in childhood. For some eight years he had had some stiffness in his right knee. He had noticed some loss of hearing in the right ear for the past three years which did not seem to be progressing.

No family history of tuberculosis, cancer, or diabetes could be elicited. Venereal infection was denied. He had smoked cigarettes since childhood. He began drinking beer at the age of fourteen, taking an occasional drink. As a young man he was accustomed to drink about a pint or two of beer daily. Since his marriage, at the age of twenty-four, he has been in the habit of drinking half alcohol and hot water flavored with lemon very frequently and for a number of years three times a day before his meals. He denies ever having been intoxicated.

Examination at that time was essentially the picture he presents tonight. His weight is 142 pounds, what it was two years ago, although he states he has lost and regained 24 pounds during the interval. The color of his face and neck suggests a deep tan, while the hands besides being dark are slate-tinged. Xanthomata are present on both upper and lower eyelids. There is no change in the pigmentation of the mucous membrane of the mouth, the skin of the axillæ, nipples, pubic region or feet. There is no adenitis or jaundice present. The abdomen is moderately enlarged and a mass continuous with the liver extends downward some three fingers' breadth below the level of the umbilicus on the right and corresponds to a marked enlargement of the liver lobe on the left. The lower border is distinctly sharp and indurated. Splenic dullness is increased, but the border of the spleen is not palpable. No ascites can be determined. Physical examination fails to show other abnormalities.

Blood pressure two years ago was 110/70. Repeated examination of the urine failed to show the presence of bile or other abnormality.

Blood examination was Hb., 70 per cent; R.B.C., 2,700,000; W.B.C., 8,200; and a normal differential count. The blood Wassermann was negative.

The roentgenogram of the stomach failed to show any filling defect, but the stomach and colon were distinctly pushed to the left and downward respectively.

The patient lost weight during his month's stay in the hospital and weighed 118 pounds on discharge. A neoplasm affecting the liver was suspected and roentgen-ray treatment was advised, but only one treatment was given.

The patient was lost sight of until yesterday (May 12, 1925). He states he has had great difficulty in obtaining any work he can do because he cannot pass a physical examination. He feels stronger, can walk several miles without difficulty and has gained in weight from 118 to 142 pounds. He thinks his abdomen is slightly smaller and the pigmentation of his hands somewhat less than two years ago.

The patient appears somewhat improved, due doubtless to his gain in weight. Blood examination now is: Hb. 85%, R.B.C. 4,500,000; W.B.C. 4,600. The urine is normal. Fluoroscopy shows no mediastinal thickening. There is poor excursion of the diaphragm on respiration and the dome of the liver extends nearly to the nipple level on the right. Blood pressure is 114/76.

Diagnosis: Hemochromatosis.

In 1882 Hanot and Chauffard reported two cases of diabetes mellitus associated with hypertrophic cirrhosis of the

liver and a bronze-like pigmentation of the exposed surfaces of the skin. In the next few years several similar cases of so-called bronze diabetes were reported by other writers.

In 1899 von Recklinghausen described a condition of general pigmentation of the viscera which he called hemochromatosis and pointed out its relation to bronze diabetes. He described two forms of pigment present, one the brown pigment, hemosiderin, which reacted to iron tests and which was found disseminated throughout the liver and pancreas particularly, but also in the lymph glands and skin. The other pigment, hemofuscin, ochre-yellow in color, which did not react to tests for iron, was found in the smooth muscles of the stomach and intestines particularly.

Some hundred cases of hemochromatosis have been reported to date.

In 1921 Blanton and Healy summarized the eighty-one cases so far reported. The liver in such cases is enlarged and cirrhotic due to both intra- and extra-cellular deposits of pigment—for the most part hemosiderin. The pancreas is golden bronze or brown in color and fibrotic, the islands of Langerhans being rarely affected. Eighty-five per cent of the cases reported had shown sugar in the urine. The spleen varied in size and the abdominal lymph nodes particularly showed brown or chocolate-colored changes. Iron pigment was found in the skin in small amounts in only half of the cases reported.

Explanation as to the cause of the disease has for the most part been theoretical. The picture points to a toxic agent affecting liver cells particularly and possibly red cells also, although anemia is not the rule. If red cells are abnormally destroyed, the destruction is kept pace with by new cell formation. We do know that hemosiderin deposits are found in pernicious anemia also.

A recent contribution to the subject has been made by Mallory, who reported in the January, 1925, number of the American Journal of Pathology, the finding of ten cases with pigmentation of the viscera justifying the diagnosis of hemochromatosis in a series of 288 necropsies performed during the year ending March 1, 1923, at the Boston City Hospital. Just as astonishing was the failure to find a single case in the following year.

The two outstanding features in the study of these ten cases was the frequent history of the excessive use of alcohol and the exposure to copper poisoning in the trades. Suspecting that the two factors were related, investigations were made.

Rabbits were administered copper orally, intravenously and subcutaneously with resulting hemofuscin deposits in the liver and other organs. Analysis was then made of numerous alcoholic beverages. Whereas wines contained in most instances only a fraction of a milligram of copper per liter, and many specimens of distilled liquors contained less than 10 mgm. of copper per liter, enormous quantities of copper were found in some specimens of moonshine. One sample contained as high as 1,250 mgm. of copper per liter, corresponding in toxicity to 4.95 c.c. of copper sulphate.

The logical conclusion is that hemochromatosis is the result of copper poisoning. Mallory states that whereas the

human organism can tolerate small doses of copper, the excessive absorption of copper over a prolonged period of years produces the picture of hemochromatosis. When the pancreas becomes sufficiently affected, diabetes mellitus complicates the picture.

As sources of copper poisoning, Mallory points out:

1. Distilled liquor contaminated with copper dissolved from copper condensers by the action of volatile organic acids (citric and acetic) distilled over with the alcohol.

2. Occupations in which copper is absorbed by inhalation of dust or handling.

3. Acid foods (fatty acids in lard, organic acids in jellies, candies, etc.) cooked in copper vessels.

My patient is the picture of hemochromatosis. The low blood pressure and gastric crises of Addison's disease are lacking. The duration is too long for a neoplasm involving the liver. There is no history of poisoning from arsenic or silver. History of lues is lacking and the Wassermann is negative. The lack of jaundice is against a Hanot's cirrhosis.

Diabetes is likely to develop and the patient has been warned to cease the use of alcohol.

DISCUSSION

DR. L. A. NIPPERT: Dr. Drake's reference to the necessity of taking a careful history is illustrated by the history of a farmer who complained of persistent cough and expectoration which troubled him for several years. Nothing definite was found on physical examination but the fluoroscope showed black deposits scattered throughout both lungs. On further questioning it was found that he had worked in a copper mine for fifteen years before he became a farmer nine years ago.

DR. A. C. STRACHAUER (Minneapolis) reported a case of resection of two-thirds of the stomach for a large ulcer, the interest in the case being on account of the pre-operative diagnosis of carcinoma of the stomach so advanced as to probably be inoperable.

Patient, Henry P., aged 63 years, was admitted to the medical service of the University Hospital complaining of cardiac symptoms, with nausea, weakness, and loss of appetite. When seen in consultation by the staff of the surgical service, the patient's hemoglobin was 28 per cent, R.B.C. 1,820,000, W.B.C. 7,800; free HCl 0; total 0; stools positive for blood. Fluoroscopic examination showed a large filling defect on the lesser curvature of the stomach, believed to be cancer. As there was no evidence of any metastasis, the cul-de-sac being negative on rectal examination and the supraclavicular findings negative, it was felt that the only hope for the patient was through operation. Two pre-operative blood transfusions were given, raising the hemoglobin to 34 per cent and the red blood cells to 2,100,000.

Operation: On opening the abdomen a large lesion with a crater was exposed on the lesser curvature of the stomach. The contents of the peritoneal cavity were otherwise negative. The mass grossly appeared to be malignant, but was local and removable; therefore, an excision of two-thirds of the stomach with cautery and a poly-anastomosis with

jejunal loop about 14 inches from the duodeno-jejunal angle was done.

The patient was transfused again on the evening following the operation. There was no vomiting or distension, and save for transient auricular fibrillation on the day following the operation, convalescence was uneventful.

Microscopic examination by the University Hospital pathologist showed benign ulcer.

It is impossible to decide by the appearance of a certain large, limited group of ulcers of the stomach whether the lesion is benign or malignant. These lesions should always be removed whenever possible and microscopic examination made. Many carcinomas have been operated upon under the diagnosis of simple ulcer of the stomach, gastroenterostomy alone being performed or incomplete destruction by the cautery; the patient, after a time, died from carcinoma. Likewise, massive benign ulcers of the stomach have, erroneously, been considered inoperable, as in the above case.

Transfusions of blood should be resorted to more frequently in the pre-operative preparation of the patient. The procedure forces the resistance in extra-hazardous cases and makes operable what would otherwise be an inoperable case.

DR. A. A. LAW (Minneapolis) reported 3 cases of malignancy of the gallbladder.

DR. F. E. BURCH (St. Paul) read a paper entitled "Ophthalmoscopic Evidence of General Circulatory Disease," and showed lantern slides.

DISCUSSION

DR. MURRAY: The subject of retinal arteriosclerosis is one of a great deal of interest not only to the ophthalmologist but to the internist. A great many of these patients first come to the ophthalmologist complaining of eyestrain, blurred vision, headache, dizziness and other symptoms of eyestrain. It is of very great importance to the ophthalmologist to study all these cases carefully to see these changes. When changes occur in the retina in the course of arteriosclerosis, and they are gross changes, they are very easily recognized. Dr. Burch pointed out the changes seen in those cases. But in the early cases, in cases of hyperpiesis where fundus changes are not so marked, it is important to find them at that time. Lesions in the retina are not always good indications of the type of arteriosclerosis. There are certain changes which are found in the early stages of arteriosclerosis. Instead of having contracted arteries we often see broad arteries, full arteries with broader light reflexes. Sometimes at that stage we find a hyperemic disc, and it is important to make a very careful study of the fundus.

When we attempt to classify the types of arteriosclerosis by the changes that occur in the retinal vessels we get into a rather difficult subject. If we have a case of essential hypertension, we get, usually, certain changes in the fundus, but they may vary a great deal. I refer to the cases in which there are no renal or cardiac changes. In one of the cases Dr. Burch showed you, which I had under observation, there have been no renal changes at any time. That case showed rather marked retinal changes present, i.e., narrowing of the arteries with increased light reflex, com-

pression of the veins by arteries, also hemorrhages and areas of exudate; she had fundus changes which might have indicated hypertension plus nephritis, although the exudates did not appear as in albuminuric retinitis. This particular case had hemorrhages; the areas of exudates disappeared, and others have followed. This case also had a cerebral hemorrhage from which she recovered. About six months after the picture was taken, the patient died from abdominal hemorrhage from the mesenteric vessels.

These cases are important from a prognostic standpoint, as the condition of the retinal vessels is some indication of the condition of the cerebral vessels. I do not think Dr. Burch referred to Moore's report on this. I believe he reported on 44 cases of cerebral hemorrhage, in which 70 per cent showed arteriosclerosis in the retinal vessels and 30 per cent showed no fundus changes.

These cases are of interest to the internists and I hope we will hear from them as to the value of ophthalmoscopic examinations in these cases.

DR. FULTON: It is not as a mere matter of form that I compliment Dr. Burch on his excellent paper, for its practical merit must be apparent to every member of the Academy who has had the very great privilege of listening to it. It will be an extremely useful document to refer to and to study in the future.

I have recently read a paper, by the same author, in which he takes up the relationship of high blood pressure and vascular diseases to cataract operative procedures. In this paper he has worked up some very valuable tables which are most useful in bringing about a more thorough understanding in regard to the relationship of these conditions and in the end are instrumental in producing the best possible results for the relief of such eye conditions. In the early stages of cataract and in monocular cataracts, the ophthalmoscope gives valuable information as to the condition of the blood vessels, local and systemic. Recently I have devoted considerable time to the study of tuberculous disease of the eye. Here again this instrument is our most valuable aid.

For a long time we believed that the retina was an index for the study of kidney conditions and that the kidney condition was the chief causative factor of retinal pathology. We are now aware, however, that nephritis may not produce retinitis any more than retinitis can produce nephritis. There is a retinal picture consisting of corkscrew arteries, kinked veins, small white spots seen in all parts of the retina, especially around the maculae, and a brick-dust colored disc which were looked upon as indicative of high blood pressure due to kidney complications, but this condition may be met with independent of any kidney trouble; but when to this condition there is quickly added edema, hemorrhages, and numerous white foci, we know we have a development of parenchymatous nephritis and the end of the patient is near at hand.

I agree with Dr. Burch in his comments upon thrombosis of the retinal veins: A careful ophthalmologic study of this condition has been made by a number of oculists recently and many cases reported. It may exist with or without systemic disease. Most of the cases I have met with have been traced to a septic focus, the removal of which brings prompt relief to this form of retinal trouble.

The prognosis is always extremely favorable, especially when the pathology is confined to the branches of the central retinal vein.

The pictures shown here tonight illustrate in a very thorough and satisfactory manner the vascular diseases of the fundus, as seen by the ophthalmoscope.

The internist has much to explain in regard to blood pressure. We sometimes find a vast difference in the blood tension of the right and left arm. Blood pressure in normal blood vessels, even as high as 200, is not considered dangerous if the walls of the vessels are normal. So contradictory are the results of the blood tension taken by different doctors at different times as to indicate that the instruments used for this purpose are not as reliable as they should be. They do not seem to be as accurate as those the oculists use for taking the tension of the eye. By means of the tenometer, associated with the dynamometer, not only an accurate measurement of ocular tension but an accurate estimate of the retinal arterial blood pressure is obtainable.

This paper indicates to us very forcibly that an accurate knowledge of the fundus conditions as revealed by the ophthalmoscope aids us very materially in obtaining a correct diagnosis, prognosis and treatment of patients with diseases of the heart, blood vessels, and kidneys, as well as intracranial diseases.

DR. BURCH (in closing): I am very grateful for this discussion. I wish to call your attention to the use of the electric ophthalmoscope leading to errors in interpretation of the light reflex. The ophthalmoscope which had a beaded lens in the tiny lamp often exaggerated the reflex. If we use the slit mirror ophthalmoscope with the softer light we find it makes a great difference.

The classification of circulatory and renal diseases is not clear in the minds of the ophthalmologists, but by discussions between ophthalmologists, internists and pathologists, we are acquiring information that eventually will permit us to know how to interpret these changes much more correctly than we do today.

DR. E. S. JUDD (Rochester) gave a "Review of the Results of Operations on the Biliary Tract and Pancreas." Lantern slides and charts were shown.

DISCUSSION

DR. MANN: This has been an exceedingly interesting series of points all along the line. I only wish to touch on one or two phases, and one is the early diagnosis of chronic cholecystitis. I think we all realize that the diagnosis has been difficult to make; that in the past—or a few years ago, at least—almost no diagnosis was made unless it was of gallstones, and now we feel that gallstones are simply an end process in this inflammation of the gallbladder and come fifteen to twenty years after inflammation of the gallbladder first begins. Exactly as the early diagnosis of appendicitis used to rest on abscess, a perforation, or a gangrene, and in the early stages was not diagnosed, so it has been even a longer time before we have been able to come to an early diagnosis of chronic cholecystitis.

We had quite a series of very interesting cases which showed symptoms which did not point to the gallbladder and in many of which there was no diagnosis made. These

cases had been studied before; some in various clinics and by various groups of men, and without any adequate diagnosis. The internist and myself studied these cases, making an intensive study of them. In all of these a test meal was given, and a full fluoroscopic and laboratory examination was made, and they were completely studied from the medical side. We had definite hours each week in which to go over those cases which seemed to be nearest a diagnosis. The first case which came to operation was a young man who had so much disability that he was hardly able to work. He had symptoms which pointed to chronic appendicitis, or to chronic ulcer of the duodenum or stomach, or to abdominal adhesions, and not definitely to the gallbladder. There was no history of colic. Most of these cases give no history of colic. We looked this man over carefully; all the findings were negative. He had moderate tenderness over the gallbladder. By putting him on the table and having him bend forward with his arms hanging free, we could get under the ribs a little better than we had been able to before. On pressure he was tender over the gallbladder area in this position. When he was flat on his back we could hardly tell.

Here, then, we had a man who had been under treatment for over a year, who had not worked because he was not well enough to work; and on whom no diagnosis had been made. He had abdominal symptoms which constituted a real disability, and had tenderness over the gallbladder. I told him he might have a gallbladder but we could not say definitely. He said "If there is anything you can do, I want you to do it," so we tried. He had a gallbladder that did not look much changed from the normal. The liver had a few little markings on it, like streaks of connective tissue markings from a chronic localized hepatitis, radiating out from the gallbladder margin of the liver. I did a cholecystectomy on him and the microscope showed definitely a chronic cholecystitis.

We selected one or two more which came near this one in type of symptoms and operated them. The operative findings were similar. In the end 240 (or more) patients were carefully re-studied and out of that number we selected 57 for operation. Every one of the 57 showed pathological changes in the laboratory. The changes in the liver were very interesting. They were similar in type, but varied in the degree of the changes. In the first grade—perhaps about 25 per cent—we could not see any change with the eye. In the rest we could see changes. We studied these latter in a series of 4. In the first group we could see faint markings on the upper surface of the liver. The gallbladders were more adherent to the liver. In these would be vein-like markings more evident on the upper than on the lower surface of the liver. The second grade would be definite streaks going from the gallbladder margin of the liver, radiating like a fan. In the third class we found areas in which the connective tissue in the liver was more dense and in grooves near the gallbladder margin which left the liver substance more or less in spindle-shaped masses between the grooves of contracted connective tissue, the result of a prolonged chronic hepatitis spreading from the gallbladder region as a center. Then we got a few cases in this series in which the whole edge was atrophied like a half-moon, the color was like grayish

wet leather with the streaks running fanlike beyond it; so we felt that that was the end-result of the chronic localized hepatitis which we noticed as faint markings in the first grade. This constitutes the fourth grade of the chronic localized hepatitis.

In the whole series of cases we tried to get some kind of a history which would lead us to a diagnosis and we could not. The patients all showed some abdominal disturbance, usually connected with definite indigestion and associated with pain or distress, and causing a definite disability. There was no colic in most of the cases. But there was, first, definite disability; and, second, definite tenderness over the gallbladder area. So I think we can move ahead and make a diagnosis in these chronic cases on those two points, after all other probable diagnoses are carefully ruled out. First, a long history of abdominal pain or distress usually associated more or less with digestive disturbances and constituting a real disability; and, second, definite tenderness over the gallbladder area.

DR. DUNSMOOR: I am tremendously interested in such a presentation as Dr. Judd's, particularly with that reference showing that the real pathology does not always depend upon gallstones being present, and I agree most thoroughly with his deduction that the gravity is decidedly increased when associated with pancreatitis or an obstructive jaundice without gallstones. I am confident that pneumonia is no more frequent in biliary operations than in cases depending upon any other pathology which is above the level of the umbilicus. I personally believe that surgical pneumonias follow most frequently those cases which have severe shock which permits the pneumococcus to get the best of the fight before reaction sets in. Operations involving injury to the splanchnic system easily produce more shock than others save where there has been tremendous hemorrhage.

I am very much pleased with what Dr. Judd says about care in reducing obesity before operating. I am positive that any such procedure should antedate for a long time an operation and then allow the patient to begin the upgrade diet before operating. Recently I operated for gallstones on two women who each weighed over 400 pounds and as both made a complete recovery, they support my theory.

DR. FARR: I am sure that Dr. Judd has brought out many important points based, as they are, on a great deal of experience. I wish only to refer to two particular features in this discussion. One relates to the incidence of pneumonia and the other to local anesthesia as an aid in making a diagnosis.

I am glad to find that Dr. Judd's position is opposed to that taken by his chief, who recently stated that, as most pneumonias are embolic in origin, the kind of anesthesia makes but little difference. It is my belief that even if pneumonia is embolic in its origin, the healthy lung is better able to cope with the process than is the lung which is water-logged with infectious material from the nasopharynx—a condition which frequently results when general anesthesia has been given.

The second point relates to the question of local anesthesia as an aid in making diagnoses. I wish to refer to what we have termed the "physiologic test." We first made use of this test many years ago in differentiating between

the appendix and a right ovarian cyst as the cause of the patient's symptoms. We have now tested the method many times and believe that when traction upon a suspected organ reproduces the patient's symptoms, that this organ is apt to be the seat of the disease. Today I operated upon a dentist, 30 years of age, who had been sick for three years. He had been on bowel management for a number of months and his main symptom was pain in the left upper quadrant, especially late at night. He was slightly tender over the gallbladder and pressure over his appendix region caused referred pain on the left side. I inspected his organs at operation; the gallbladder was white and thick and there was one enlarged gland near its base. The appendix was retrocecal and obviously pathologic. Traction upon the appendix, however, did not reproduce his symptoms. After the removal of the appendix, his gallbladder was grasped and by making traction his former symptoms could be produced. This test was made four or five times and each time the patient complained of pain in the left side.

I would therefore suggest that surgeons familiarize themselves with local anesthesia and use it in abdominal surgery, in which case a very large percentage of this work can be done without special difficulty. I would further suggest that by the use of the "physiologic test" we may perhaps have a means of cleaning up the diagnosis in the case of obscure intraperitoneal lesions.

DR. L. A. NIPPERT: Dr. Judd's most instructive paper reminds me of the introduction to the discussion of gallbladder disease by Dr. Ochsner, of Chicago, which he read before the Hennepin County Medical Society twenty or twenty-five years ago. He stated that while on a visit to a small town in Minnesota he asked his friend, the doctor in charge of the hospital, how it came about that in this small town he had so many operations for gallbladder disease when in the great city of Chicago he himself saw so few. The doctor replied, "That is very simple, we diagnose our cases." Then Dr. Ochsner stated that he began to think over so many chronic cases of indigestion that troubled him year in and year out, and began to suspect gallbladder disease, operated and cured them. Suspecting an illness is often the first step to a correct diagnosis.

DR. STRACHAUER: I would like to ask Dr. Judd how much significance he attaches to a subserous deposit of fat in the gallbladder.

DR. JUDD (in closing): We are having a very interesting time in finding out just how much can be accomplished by the use of the x-ray in making a diagnosis. Dr. Carman of our x-ray laboratory is very much interested in the Graham test. That it does show the gallbladder there is no doubt, but the question arises as to the interpretation of the findings. He is quite enthusiastic over what he has been able to accomplish with it to date, and we feel that we are learning just a little more about this each day. If the gallbladder is taken out, the pathologists are pretty sure to agree that it shows some evidence of inflammation.

For a long time we have endeavored to determine the exact significance of fatty deposits in the wall of the gallbladder and also of the enlargement of the regional lymphatics, which Dr. Deaver so frequently mentions. These were some of the problems presented in our cases of Group

1 cholecystitis. So far as our present knowledge is concerned, the only point on which we can base a diagnosis in the absence of definite findings of gallbladder disease at the time of operation, is the history of attacks of pain such as occur in the presence of known gallbladder disease.

The more often one investigates the liver, the more he is impressed by the fact that the white lines in the liver and the changes in its appearance which we have attributed to primary infection of the gallbladder frequently exist in patients who have no history of gallbladder trouble and in whom we are unable to find evidence of inflammation in the gallbladder. We have observed it in exploring cases of ulcer and appendicitis. If a section of liver is excised and microscopic study made, you will always find round cell infiltration, and a condition which you will be obliged to call hepatitis.

The point which I wish to bring out is that if we study a large group of cases of early cholecystitis from the standpoint of end-results, we shall find that the percentage of cures will run very low unless the operation is based on a good clinical history in which the chief complaint was of attacks of colicky pain. Sometimes dyspepsia, migraine, and arthritis apparently improve after removal of the gallbladder.

JOHN E. HYNES, M.D.,
Secretary.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

AN UNUSUAL CASE OF VAGINAL HEMORRHAGE*

REPORT OF CASE

J. A. URNER, M.D.
Minneapolis

G. H., aged 28 years, a married woman, entered the hospital March 14, 1925, complaining of vaginal hemorrhage since March 11. Her last menstrual period was March 9 and she stopped flowing the morning of March 11. The January and February periods had been normal. The afternoon of March 11, while eating lunch, she again began to flow. This was ushered in with a sharp, knife-like pain which localized in the left lower quadrant. Following this, she flowed profusely without any pain. She consulted her physician and he put in a tight vaginal pack. The flowing stopped for a while and she removed the pack. The night before her entrance to the hospital the bleeding again became profuse, and her physician saw her at her home. He curetted the uterine cavity, put an intra-uterine pack in place and followed it with a tight vaginal pack. This partially stopped the flow, but the patient removed the

*From Division A, Gynecological Service, Dr. F. L. Adair, Chief, Minneapolis General Hospital.

HEREDITARY HEMORRHAGIC TELANGIECTASIS*

REPORT OF CASE

V. J. SCHWARTZ, M.D.

Minneapolis

packs and again the flow became very profuse. The physician was called and the patient was sent to the hospital.

She had been married eleven years. Her husband was living and well, but she had not lived with him for one and one-half years. She had one child, living and well. This had been a normal labor delivery, and puerperium. She had had no miscarriages or abortions.

Menstrual periods had begun when she was thirteen years old, the regular twenty-eight day type, of three days' duration, with moderate flow. The last period was March 9. There had been no clots or pain and no discharge.

The patient had had measles and pertussis in childhood, and typhoid fever in January of this year, but no other diseases and no operations. The family history was negative. There was no venereal disease, and examination by systems revealed nothing of importance.

When the patient entered the hospital she was definitely pale and anemic. Her pulse was 130, but regular, temperature 100, blood pressure 126/82. Examination of the chest and heart was negative.

Bimanual examination: The external genitalia, Bartholin glands, vaginal walls, and adnexæ were normal. The perineum was competent. Rectal examination showed the uterus in anterior position, normal size and consistency, freely movable, and not tender. There was a profuse bloody discharge with frank hemorrhage from the vagina. Speculum examination revealed large clots in the vagina. When these were removed the cervix appeared normal and there was no bleeding from it, but the blood seemed to well up from the posterior fornix. As thorough an exploration as possible was made of the vagina and no ulcerations or perforations could be made out, but the bleeding seemed to come from the posterior fornix (using a Graves speculum, with the anterior and posterior blades obscuring somewhat the entire field of vision). A tentative diagnosis was made of (1) possible perforated pelvic hematocoele, (2) ruptured varix of the vagina in the posterior fornix. The bleeding was controlled with a tight vaginal pack.

The next morning, March 15, the pack was removed. By using various types of specula and small retractors the bleeding point was found on the anterior vaginal wall to the left of the urethra and under the base of the bladder. There was definite arterial bleeding from this point. A tight pack was the only effective means of stopping the bleeding. The patient was given 350 c.c. of citrated blood intravenously, followed by 500 c.c. of normal saline solution. For the next three days it was necessary to keep the vagina packed to control the flow. March 19 another small transfusion was given. The vagina was kept packed off and on until March 27 when, under gas anesthesia, the vaginal wall was explored. The bleeding point was found as mentioned above. The flow came from the bottom of a blind pocket of sufficient size to admit the tip of a forceps and about 1.5 cm. deep. The pockets were lined with what appeared to be normal mucosa and there was apparently no inflammation. The vaginal mucosa was incised, the bleeding point ligated and the cavity obliterated and closed with catgut.

The patient recovered promptly and aside from a rather severe secondary anemia she had no further trouble.

L. W., a housewife, aged 49, was admitted to the hospital December 4, 1924, with severe epistaxis. She had been troubled in this way innumerable times since she was fourteen years of age. She had also had severe hemorrhages from the tip of the tongue and from the tip of her right little finger on several occasions, and had been aware of a number of reddish spots on her face, tongue, and hands for many years. She had had frequent attacks of tonsillitis and had had most of the acute infectious diseases. Five years ago she had a submucous, resection elsewhere, and a perforated septum resulted. Two years ago she had a nasal hemorrhage so severe as to require hospitalization. A week prior to her admission to the hospital she had had another such attack.

During her eleven years of married life the patient had had six pregnancies, three of which resulted in miscarriages at about ten weeks. She had three children, living and well, and her husband, aged 40, was living and well. Her father died of heart trouble. An item of great importance was the fact that her mother died as a result of frequent, almost uncontrollable nasal hemorrhages. A sister died in infancy of diphtheria, and three brothers were living and well.

Except for a definite anemia secondary to her epistaxes, the patient's laboratory studies showed nothing abnormal. The coagulation time was five minutes, the bleeding time two and one-half minutes. By a firm tamponade the epistaxis was held in check for a day or two at a time, but shortly after the removal of each pack the hemorrhage recurred. The process, therefore, had to be repeated a number of times before it was possible to attempt cauterization. This was finally begun and continued with success, being directed principally at the margin of the perforation and at the septal surface immediately adjacent to this.

The patient was transferred to the Medical Service, where attention was drawn to the fact that there were a number of dark or bright red spots, from 1 to 4 mm. in diameter, scattered over the body, both in the skin and mucous membrane. Most of these were rounded and they were present on the dorsum and the tip of the tongue, the lips, the hard and soft palates, the nasal mucosa, the conjunctivæ, the auricles, the cheeks, the hands and fingers, and one or two on the trunk. These spots greatly resembled petechiæ, but differed markedly in that the petechiæ are temporary structures, being only small bloody effusions, whereas the lesions present were greatly engorged, swollen capillaries and venules; in other words, telangiectases.

It would be of great importance to know whether or not the patient's mother, who died as the result of epistaxes, also had these vascular anomalies. I believe that she had,

*From the Eye, Ear, Nose and Throat Service, Dr. F. J. Pratt, Chief, Minneapolis General Hospital.

although there is no proof beyond the history. If such were the case, another family would be added to a very small group, for up to 1923 there had not been more than thirty reported families, involving fifty-seven patients, who exhibited this hereditary hemorrhagic telangiectasis. Even if there were no such lesions in the preceding generation, it still remains a rare affection.

Ample precedent exists for the study of this condition in rhinology, for Chiari was one of the very first to recognize these lesions as telangiectases in a case of epistaxis, although he regarded them as caused by or associated with hemophilia. As a matter of fact they have no relation to hemophilia, purpura, acquired angiomas, or the hemorrhagic diathesis.

I wish only to mention very briefly the principal features of hereditary telangiectasis as recapitulated by Weber in 1908 and Steiner in 1917. The only constant etiologic factor is heredity. Both sexes are involved about equally and may transmit the disease in the same degree. It is congenital, and is characterized by a development defect in the walls of the dilated capillaries. These latter lie immediately beneath the markedly thinned epidermis or epithelium. They are simply large blood-spaces, lined only with a single layer of endothelium, and their walls seem to have no elastic nor muscle fibers. This structure predisposes to easy rupture, either traumatic or spontaneous, and so to hemorrhage of small or great degree. This occurs most frequently from the nose, usually long before the individual lesions appear, which may not be until middle life, and less often from the tongue and fingers as in the case of our patient. Unfortunately the hemorrhages and subsequent anemia seem to increase with age in frequency and in severity, but by thorough use of the cautery, preferably the chromic acid bead, and possibly radium, great improvement, if not complete cure, may be brought about.

TRANSFORMATION OF THE MIDDLE FINGER INTO A THUMB

REPORT OF A CASE

PAUL N. JEPSON, M.D.

Section on Orthopedic Surgery, Mayo Clinic
Rochester, Minnesota

A young man, aged twenty-four, drove thirty-five miles to the Mayo Clinic after sustaining a traumatic amputation of the left thumb and forefinger. The first phalanx of the middle finger was fractured and the skin on the lateral side was badly lacerated. The remaining phalanges were attached to the hand by the skin on the medial side of the finger. The blood and nerve supply on the medial side appeared to be intact. The skin over the dorsum of the hand had been torn away, leaving the tendons exposed. After consultation, it was thought advisable to make an attempt to utilize the remaining phalanges of the middle finger as a thumb. The patient was anesthetized and the hand thoroughly cleansed with green soap and then painted with iodine. The fractured first phalanx of the third finger was removed, and the proximal end of the second phalanx

freshened down to cancellous bone. The terminal end of the first metacarpal bone was also freshened and the remaining phalanges of the middle finger were transplanted and sutured to the stump of the thumb with chromic catgut. These sutures were placed through what remained of the old capsule. The skin which remained intact on the medial side of the third finger served as a covering for the stump of the amputated index finger and the medial



Fig. 1. Palmar surface of the hand.

side of the newly made thumb. The remaining skin was brought around over the dorsum of the hand and sutured in place, and a temporary splint applied.

Fifteen hundred units of antitetanic serum was given to the patient, and a dressing applied and left intact for four days. At the end of this time the dressing was changed, and it was found that areas of the skin had sloughed away. Moist dressings were then applied every three hours, and at the end of ten days the hand was entirely cleaned up, leaving a fresh raw surface to which a Thiersch skin-graft was applied. The skin-graft took nicely and two weeks later a cast was applied and the patient sent home. He wore this cast for about two months and was able to plow corn and do general farm work. At



Fig. 2. Dorsal view of the hand.

the end of this time, roentgenograms showed that bony union had taken place, and the patient was allowed to go without the cast (Figs. 1 and 2). Physiotherapy was started and now the patient is able to grasp coarse objects between the newly made thumb and the fourth and fifth fingers, and it is expected that with further physiotherapy he will gain more motion.

The average length of human life in the United States is about 56 years. The average span of life in this country has been lengthened approximately fifteen years since 1870.
—Hygeia.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH

THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

TUBERCULOSIS OF THE NERVOUS SYSTEM: Anthony Feiling (Tubercle (London), 1925, VI, 313). The subject is discussed under the following headings:

First, tuberculous tumors or tuberculomata of the brain and spinal cord; secondly, the nervous complications of spinal caries; and, thirdly, tuberculous meningitis.

As regards tumors of the brain, only a small proportion, probably not over 5 or 6 per cent, are tuberculomata and the diagnosis is so difficult that to defer an operation for the relief of intracranial tension, with perhaps the chance of preserving visual acuity, as well as saving much suffering, in the fear that the tumor may be a tuberculoma, is an excess of caution which is not warranted by the facts.

In cases of Pott's disease, the spinal cord may be affected in one of three ways: first, by the pressure of an abscess, which, penetrating the posterior common ligament of the spine, may either press on the anterior aspect of the theca or extend all around it; secondly, a chronic tuberculous pachymeningitis may be set up; thirdly, and by far the least common, the spinal cord may be compressed by a very sharp angular curvature or by a loosened piece of dead bone.

Just as in cases of compression paraplegia due to other causes, the histological changes found in the cord and the amount of secondary degenerations in the nerve tracts are generally much less than might have been expected—always, indeed, much less than the loss of function in life would lead us to suppose. This fact may be ascribed to the remarkable powers of recovery which are sometimes displayed by these cases, a natural event which has to be carefully kept in mind when questions of treatment, and especially of any operative treatment, are discussed.

A generalization is made that the change from a spastic paraplegia in extension to one in flexion is a grave sign, while the supervention of flaccidity in a case previously spastic is of even more ominous significance.

In regard to encephalitis, there are no symptoms peculiar to tubercular meningitis which may not be found in

encephalitis lethargica, but possibly some of the following points may be held to have some value in diagnosis.

(1) The onset of the disease is as a rule more abrupt in encephalitis than in tubercular meningitis, though we must remember that the early stages of the disease in tubercular meningitis may escape recognition.

(2) Well-marked vomiting as an early symptom points rather to meningitis than to encephalitis.

(3) In the later stages of the disease, when the patient is more or less stuporous, it is generally easier in encephalitis to arouse him to answer questions more or less rationally than it is in a corresponding stage of tubercular meningitis.

(4) Marked stiffness or rigidity of the neck, and even more head retraction, are certainly more indicative of meningitis than of encephalitis; this distinction, however, may lack value, because, in my own experience, any severe degree of head retraction or even stiffness of the neck has been the exception in cases of tubercular meningitis in the adult.

(5) Persistent ocular palsies, and especially palsies of conjugate movement, such as elevation of the eyes, are more characteristic of encephalitis.

(6) Sometimes, even in cases which are quite stuporous, the typical Parkinsonian immobility of facies and generalized rigidity of the limbs will provide a valuable clue in favor of encephalitis. Finally, though this is really a confession of weakness, only time may inform us with certainty; for it is, of common consent, very unusual for cases of tubercular meningitis to survive for more than three weeks after the first definite onset of symptoms.

A. T. LAIRD, M.D.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

RESECTION OF THE STOMACH BY KOCHER'S METHOD: Tetsuzo Aoyama (Annals of Surgery, lxxxi, 1925, 125-131). The author describes in detail the technic of the Kocher operation, which consists of resecting the involved portion of the pylorus, invaginating and suturing the cut edge of the stomach, and anastomosing the cut end of the duodenum to the posterior gastric wall. He favors this method because it is a rapid operation with security of sutures and after resection there is a reconstruction of a form which most resembles the normal stomach.

Forty-two cases which have been operated by this method are reported. Of these five had ulcerous diseases and thirty-seven had carcinoma of the stomach. No deaths occurred in the benign cases. In the cancerous cases there were seven deaths (19 per cent). Of these, two patients

had resection of the transverse colon at the same time. In one case peritonitis developed. In four cases death was not attributed to peritonitis and there was no apparent retention of ingesta.

A case of adenocarcinoma is reported as living and well six years after resection by this method. Moreover, free hydrochloric acid was absent before operation but has now reappeared.

J. K. HOLLOWAY, M.D.

ACUTE PANCREATITIS: Sir Berkeley Moynihan (*Annals of Surgery*, 1925, lxxxi, 132-142). Three types of acute pancreatitis are described in this article, namely, hemorrhagic, gangrenous, and suppurative. These types differ only in degree. In the most acute form death is rapid unless early operation is performed. In the more chronic forms the patient may survive, and abscess in and around the gland may form so slowly that there is time for it to point in front.

The symptoms are pain, in the worst intensity, in the epigastrium, felt also in the back and often in both loins. Collapse follows, in which the pulse rises rapidly and loses volume. The blood pressure falls. There is profound shock, of greater severity than the greatest hemorrhage could cause. Vomiting is almost invariably present and occurs early. A peculiar type of cyanosis is often seen. The face is livid and patches of slate-blue color may be distributed irregularly over the abdomen and limbs. When this is observed it is considered undeniable evidence of acute pancreatic disease. The respirations are quick, faint, and shallow. The abdomen is rigid, with firmness most marked in the epigastrium. This rigidity is obdurate and unyielding, and immobility of all the abdominal muscles, including the diaphragm, is complete. Tenderness is most marked above the umbilicus.

By comparison the symptoms of other acute abdominal conditions are mild with those of acute pancreatitis. The collapse following intraperitoneal hemorrhage is not so great. The pain seen in perforation of a gastric or duodenal ulcer, while severe, does not reach the intensity of that experienced in acute pancreatitis, and shock measured by pulse rate and volume and fall of blood pressure does not occur in perforation. Pulse rate in perforation is changed very little from the normal. In hepatic colic the patient is restless, moaning and twisting; in perforation of an ulcer he is motionless; in acute pancreatitis he is almost so. Acute intestinal obstruction may closely mimic acute pancreatitis, but here there is no collapse and there is no sudden and overwhelming seizure. Moreover, general distention which follows intestinal obstruction is unlike that of acute pancreatitis, where there is distention above and flatness below.

The cause of acute pancreatitis is not always well understood. However, the close relation of the ducts of the liver and the pancreas, and the peculiar anatomic proximity of their outlets into the duodenum, the lymphatic system whereby in cases of gall-bladder infection lymphangitis spreads downward to the common duct and pancreas, and

the frequent association of cholelithiasis and pancreatitis, both acute and chronic, help to confirm the belief in the dependence of pancreatic inflammation upon causes arising in the biliary passages. In acute pancreatitis the immediate cause of the gland necrosis is the activation of the pancreatic juice by some agent or other. According to Nordmann's experiments (*Arch. Klin. Chir.*, 1913, cii, 66) stasis of pancreatic juice within the ducts of the gland and the access of organisms with or without bile to the duct were necessary for the production of pancreatitis in dogs. The author discusses the work of Arclübal and Mann, wherein it was shown that the occurrence of acute pancreatitis as a result of the injection of bile into the duct of the pancreas must be exceedingly small. Anatomic or physiologic conditions are favorable in only 4.5 per cent of the bodies examined (Judd). However, the author suggests the possibility of these conditions being present in a high percentage of persons who suffer acute pancreatitis. He further believes two conditions to be essential in the development of pancreatitis: first, an anatomical arrangement of the parts at the termination of the two ducts which permits of their conversion into one channel by closure of the orifice of the ampulla into the duodenum, and secondly, the presence of infected bile, associated or not with cholelithiasis in the gall-bladder or in the bile ducts. Acute lymphangitis can play little part in the onset of the most acute forms of pancreatitis.

Treatment consists largely of securing adequate drainage of the pancreatic area and release of pressure of bile upon the ducts. Cholecystostomy in many cases is sufficient. Subsequent elimination of gallstones and gall-bladder is desirable.

J. K. HOLLOWAY, M.D.

DRAINAGE OF THE THORACIC DUCT IN EXPERIMENTAL PERITONITIS: H. Hoyt Cox, M.D., and Lewis B. Bell, M.D. (*Annals of Surgery*, lxxxi, May, 1925, No. 5, 911-917). Following the work of Costain and others the authors of this article used a number of series of dogs to determine what results they could obtain in treatment of peritonitis by establishing thoracic duct fistulæ and also by ligation of the duct. They also carried out closed loop and peritoneal absorption experiments and reported on their results as follows:

It was not possible to find a lethal standard because they were unable to bring about a uniformly fatal peritonitis by following the technic of Costain.

"Drainage of the thoracic duct did not prolong the lives of the animals but appeared to hasten death." "Ligation of the duct without drainage seemed to prolong the lives of the dogs."

In closed loop experiments, drainage of the thoracic duct did not materially prolong the lives of the dogs.

In the experiments on absorption from the peritoneal cavity they found that the rate of absorption through the thoracic duct was not constant.

W. P. HERBST, M.D.

THE ROLE OF THE PYLORODUODENAL NERVE SUPPLY IN THE SURGERY OF DUODENAL ULCER: Benedetto Schiassi, M.D., Modena, Italy (*Annals of Surgery*, lxxxi, May, 1925, No. 5, p. 939). The author of this article proposes that the mechanism of the anatomic alteration in the duodenum through the sympathetic nervous system begins with the action of the brain on that nerve. With this as a thesis he describes his procedures in full and reports his results.

The method of severing the sympathetic nerves to the stomach consists of an incision two and one-half inches in the gastrocolic epiploon along the antrum and body of the stomach, through which the posterior pyloroduodenal region can be explored; an incision of the gastrohepatic epiploon, one-third inch above and parallel with the lesser curvature, in which the pyloric artery and a few small vessels with the nervous elements of the sympathetic are divided; through the first incision the stomach is incised vertically from the lesser to the greater curvature through the serous and part of the muscular coat; Lembert suture of this incision with closely placed silk sutures; closure of the gastrocolic epiploon with a few interrupted sutures; a similar incision on the anterior surface of the stomach sutured as in the posterior incision, thus accomplishing section of the parasymphathetic branches of the vagus.

The cases he has treated have been divided into three groups:

(1) "Opening the abdomen of patients who did not suffer serious hemorrhages and did not in consequence need an immediate rest of the pyloroduodenum: as soon as it was found that the lesion did not cause any stenosis or deformity of the intestine, I made only the excision of the nerves of the two sections (patients thus operated on eight in number)."

(2) "In those patients in whom I found deformity of the pyloroduodenal region, so as to produce a difficult evacuation of the stomach, who also had copious hemorrhages, I did besides the above also the gastro-enterostomy (patients thus operated fifteen in number)."

(3) "In those patients upon whom a gastro-enterostomy had been performed and in whom radioscopia showed a good function, notwithstanding the return of morbid symptoms, I made only the excision of the two sections, sympathetic and parasymphathetic (patients thus operated on three in number)."

"The impartial and careful observation and attention given to all these patients, and the keen interest shown by my colleagues in following with me for a long time the history and the details after the operation, have fully convinced us that this operative proceeding is the best which has been done so far as the treatment of duodenal ulcer."

There are illustrations of the anatomy and operative procedures.

W. P. HERBST, M.D.

CLINICAL NOTES ON TUBERCULOSIS OF THE KIDNEY: Mauritz Persson (*Annals of Surgery*, lxxxi, 1925, 94). Rarely does a kidney extirpated for tuberculosis show any signs of previous trauma whether the kidney is

very much destroyed by the tuberculous process or whether the tuberculosis is still at an early stage. The author reports a case of a previously healthy man of thirty-two, who on March 7, 1920, was hit by a heavy stone across the upper part of the abdomen. Hematuria followed with intense desire to micturate, and pain localized in the right side of the abdomen just below the costal arch. There was no pain in the back and no radiation of pain. Frequency, urgency, and nocturia following. Urination was without pain and the amount of urine did not increase, but the urine remained bloody. Abdominal pain and intermittent hematuria persisted until after August of the same year. There was still some pain on January 24, 1924, and examination at that time showed microscopic blood in the urine, but no tubercle bacilli. Upon cystoscopic examination no urine was obtained from the right kidney. The left was normal. A right nephrectomy was done. The upper pole of the kidney presented a dark oval fluctuating area half the size of a hen's egg, which proved to be a traumatic cyst (illius). The surface of the kidney was otherwise normal. Separated from the cyst by a partition half a millimeter in thickness was a second cavity the size of a Spanish nut. Carious degeneration had an extension of two millimeters all around the cavity, in the wall of which were numerous tuberculous nodules. There was no macroscopic communication with the renal pelvis.

The author contends that while the cyst might be a true cystic formation, a cystic tumor, or the remains of a healed tuberculous process, the only reasonable explanation is that it was due to trauma. There is doubt concerning the relation of the two processes, though it is suggestive that the trauma produced a locus minoris resistentiae, at which place an embolus with the bacillus had settled.

In *Acta chir. Scandinav.* IV, 1923, Perman published analyses of fourteen cases of tuberculous kidneys, with duplication of pelvis and ureter, which he found in the literature, as well as a similar case of his own. In this he called attention to the question of extension of the tuberculosis within the kidney. The author reports a case of his own presenting a similar anomaly, a male of eighteen, in which the process involved the lower two-thirds of the kidney and ureter. The upper third of the kidney was apparently separated from the lower third by a well formed fibrous tissue septum. However, four typical tubercles were found in this upper portion. In the lower two-thirds was an extensive and advanced tuberculous process. The upper third contained only a few microscopic tuberculous foci having subcapsular location in the cortex. Some microscopic tubercles were found in the same location in a pyramid. There were no changes in the mucous membrane or in the ureter.

In Perman's review two of twelve showed involvement of both pelves and ureters. In ten cases there were no macroscopic changes in either the parenchyma or in the pelvis or ureter. But three of these cases had microscopical tubercles in the sound part of the kidney. In two, tubercles were located in the cortical structure. In Perman's own case there were no microscopical changes seen in the sound part of the kidney.

Ekehorn's theory purports that renal tuberculosis has a hematogenous unilocular origin and that its further exten-

sion within the kidney usually takes place through an infection of the pelvis and papillary apices in the neighborhood and through the starting from here of a peripheral tuberculation of the renal parenchyma. According to this theory, the tuberculous changes would be limited to one-half the kidney, whereas the other half of the kidney and pelvis and ureter would be free from tuberculosis for a comparatively long time. An infection of this part of the kidney would take place through a tuberculous process ascending via the ureter. According to Crabtree, extension would take place at an early stage via the subcapsular lymphatic plexus in the cortical structure of the kidney. In many cases then the changes should be found in the cortex of the sound portion, even though there are no changes in the corresponding renal pelvis and ureter. The author inclines to Crabtree's explanation, although he expresses no opinion as to which is the more common route.

J. K. HOLLOWAY, M.D.

PEDIATRICS

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HEAD INFECTIONS IN INFANCY AND CHILDHOOD: Clarence H. Smith, M.D. (Arch. of Ped., April, 1925). There is a wealth of contributions about sinusitis in the adult, but there is comparatively little on record about our present theme. At birth the ethmoid labyrinth is the most important of the sinuses; it is then well developed, having the full number of cells anterior and posterior, and even then it is anatomically significant. After the sixth year the sphenoid and frontal sinuses are well developed. They are outgrowths from the ethmoid cells. If no ethmoid cell extends into the frontal bone there will be no frontal sinus. The maxillary sinus is small at birth but it develops rapidly, soon acquiring clinical significance.

When infants under two years of age acquire a disease affecting these sinuses it always attacks the tissues as a whole rather than any particular sinus. The most common cause of sinus infection is from adenoids and diseased tonsils. These infect by direct contiguity of tissue and through the lymphatics. Nasal discharge and nasal stoppage are two prominent symptoms. The discharge may be post-nasal, passing into the pharynx and esophagus. Sneezing is also common. You can suspect chronic paranasal sinusitis when a child is listless, has poor appetite, is underweight and has a poor color, especially if these symptoms persist after removal of adenoids and tonsils and if there is no tangible systemic fault discernible.

Transillumination is of no service in children. X-ray examination is most important. Only with this can you tell whether or not the patient has a frontal, a sphenoid,

or a maxillary sinus, and, if present, whether it is of clinical importance.

R. N. ANDREWS, M.D.,

MUMPS OF THE PANCREAS: Albert M. Stevens, M.D. (Arch. of Ped., May, 1925). Epidemic parotitis is a disease which has no place in the ordinary hospital service because of its contagious nature. The hospital for contagious diseases ignores mumps because it is relatively harmless.

During the past winter four cases of mumps were observed which were complicated by a very characteristic and constant syndrome. A child is seen with typical parotid swelling, mild fever and constitutional reaction. By the fourth day the fever is less and the swelling has passed its maximum. On the fifth or sixth day there is very little fever, the swelling of the face is noticeably smaller and the child seems nearly well. At this point, there is complaint of discomfort in the epigastrium with a great deal of prostration and the temperature is found to be 102 to 104. Then the child begins to vomit; nothing is retained on the stomach for 36 to 60 hours, during which time fever persists with rapid pulse, anorexia, and constipation. Then the temperature drops to normal, food and water are taken freely and, except for general weakness and eyes bloodshot from violent retching, the child appears none the worse.

Pain was generally of mild character at onset, referred to a point just below the ensiform appendix. Tenderness in the epigastrium was a constant sign; pressure to elicit this sign usually brought on a wave of intense nausea. Vomiting was the outstanding symptom, coming on within an hour of the temperature rise and persisting for an average of two days with total intolerance for food. Prostration was noted at the onset out of all proportion to the degree of pain complained of. Constipation was the rule.

It is believed that this condition is a metastasis to the pancreas of the virus causing mumps.

Certainly, the symptoms are sufficiently alarming to justify the exclusion of appendicitis, intussusception and ileus by the most careful observation. In the presence of a parotitis, the probabilities are in favor of pancreatic mumps.

R. N. ANDREWS, M.D.

DYSPEPSIA IN THE BREAST-FED, NEW-BORN INFANT: CAUSES, SYMPTOMS AND MANAGEMENT: Arthur M. Dannenberg, M.D. (Arch. of Ped., May, 1925). Breast-milk is a combination of carbohydrate, fat, protein and mineral salts. The carbohydrate is in the form of lactose, a disaccharide which is but slowly absorbed in the intestinal tract. Consequently, much of it reaches the lower portion of the small intestine, where it is fermented by the aciduric bacteria with the production of lactic acid, carbon dioxide and hydrogen. If the infant's carbohydrate tolerance is not exceeded by the lactose content of the breast-milk, little fermentation occurs. But should the digestive tolerance to lactose be congenitally low, or should an unusually large quantity of lactose be present in the

milk, fermentation becomes excessive and large quantities of lactic acid and gas are produced.

The rôle which the fatty acids themselves play in stimulating peristalsis is still debatable. There seems to be no question, however, that clinically, in cases where the fat content of the milk is very high, the same irritative symptoms in the intestines are observed as occur in excessive sugar fermentation. The normal proteins of breast-milk so rarely play a part in the alimentary disorders of the new-born that a discussion of the physiological processes involved in their digestion may be omitted.

The mineral substances of the milk are largely absorbed from the small intestines and to a negligible degree from other parts of the alimentary canal. After absorption they may in part re-enter the intestines from the circulation. Mineral salts are also supplied by the digestive secretions. These salts are absolutely necessary for digestion and metabolism, but their action is complicated and not as yet thoroughly understood.

Among the ordinary symptoms are colic, vomiting, and frequent loose bowel movements. Of these, colic is, perhaps, the most annoying, because of the infant's persistent crying and restlessness. It is invariably accompanied by marked gaseous distention of the abdomen, straining, the frequent passage of flatus, and loose bowel movements.

The bowel movements of dyspepsia are characteristic. They are usually discharged quite forcibly with the flatus, and are, therefore, frothy. They are numerous, varying from three to twelve or more a day, are loose or liquid, and rarely, if ever, pasty. They have a sour odor and give an intense acid reaction to litmus.

Infants with dyspepsia will, as a rule, eagerly take the breast whenever offered. This leads the untrained mother to believe that hunger is the cause of the crying and restlessness.

Treatment.—A reduction of the sugar and fat intake in infants is a prime consideration. In the well-developed robust infant, it is a better plan to decrease the sugar and fat intake by lessening the frequency of the feedings, shortening the time at the breast and making up the decreased bulk intake with one or two ounces of boiled water given immediately before a feeding. Babies obtain from 40 to 60 per cent of their feeding in the first two minutes, and from 60 to 80 per cent in the first four minutes. The shortened feeding must, therefore, not exceed five, or at the most, six minutes. With the knowledge that the dyspepsia is due to excessive acid fermentation within the intestinal tract, the logical thing to do to combat it is to give the infant, in addition to a shortened breast-feeding, a food rich in mineral bases and proteins. Cows' milk lends itself ideally to this purpose. A skimmed cow's milk boiled for two minutes and diluted one-third to one-half with boiled water should be used. A 1 to 3 per cent calcium caseinate solution may be substituted for the boiled skimmed milk. Within a week or two, the quantity of skimmed milk or calcium caseinate solution given to the infant may be reduced. Then, if the dyspepsia does not return, it may be reduced still further until the infant is entirely on the breast.

Drugs play practically no part in the treatment of dyspepsia of new-born, breast-fed infants. Castor oil, calo-

mel, or olive oil should never be given to infants with dyspepsia. It is dangerous practice, for the additional loss of fluid due to the purgation increases the dehydration and further lowers their tolerance for breast-milk.

R. N. ANDREWS, M.D.

RECENT STUDIES IN BRONCHIAL ASTHMA AND CHRONIC BRONCHITIS IN CHILDREN: Ralph H. Kuhns, B.S., M.D. (*Archives of Pediatrics*, February, 1925). Recurrent attacks of dyspnea without a rise in temperature and with the lungs containing sibilant râles which gradually clear up in from one to three days should be looked upon as asthma, no matter how young the infant; and the cessation of râles after the injection of adrenalin will prove the diagnosis.

It is generally agreed that asthma is due to a stenosis of the bronchioles. It has been demonstrated that in animals dying from anaphylactic shock, the cause of death is a stenosis of the bronchioles. From this viewpoint asthma is a manifestation of anaphylactic shock in an individual who has become sensitized to a particular foreign protein substance. As anaphylaxis is a peripheral phenomenon, asthma is also peripheral, not a central neurosis.

Until very recently, asthma has been looked upon as a disease having no pathological changes, due to the fact that it was considered to be a neurosis. Pottenger, of California, in a recent article states that asthma has an essential pathology consisting of a thickening of the entire bronchial wall, which at times almost obliterates the lumen of the tubes. This thickened musculature results from an overstimulation of the physiological process, for the vagus nerve is in a state of hyper-irritability; consequently these tissues are subject to prolonged vagus action.

Toxemia is the only factor that is common to all the so-called types. Just how much this toxemia is due to faulty metabolism, and how much to septic absorption is difficult to say, but both factors are present in most cases. Every asthmatic hangs in a state of delicate balance between the absorption and the elimination of toxins. An attack of asthma is the crisis of a toxic storm.

In the author's experience, the first attack of asthma in infancy was usually traced to a change in diet, with egg, cereal or milk in the order of frequency. In early childhood the pollens and animal extracts were the next most common offenders. In late childhood he found frequent attacks of bronchitis, pneumonia, influenza, pertussis, measles and chronic sinus infections the common diseases preliminary to a chronic bronchitis with asthma.

In treating the acute attack, mustard plasters applied to the thorax will often relieve the spasm sufficiently to reduce the respiration. Adrenalin chloride given hypodermically is also a useful drug to combat the severe dyspnea.

Inasmuch as the activity of the vagus nerve which belongs to the parasympathetic system is antagonized by the sympathetic nerves and inasmuch as a relative increase in the calcium ions produces the same effect as sympathetic stimulation, the administration of calcium is a rational therapeutic measure in combating asthmatic paroxysms.

Exposure to the mercury vapor quartz light, together with combined calcium thyroid therapy, appears to fix permanently the ionic calcium content of the blood serum. The

ROENTGENOLOGY

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lamp is raised about one meter from the patient and fractional body exposures are made two or three times weekly or oftener. The time of exposure, at first two minutes, is increased at each treatment by from two to three minutes, depending on the tolerance of the individual. At each successive treatment the distance between patient and lamp is decreased by three inches. The smallest distance reached is about 18 inches, while the longest exposure made may reach 15 minutes or, in exceptional cases, when the tolerance of the individual is great, 20 minutes.

R. N. ANDREWS, M.D.,

THE USE OF TRIPLE DISTILLED WATER IN THE TREATMENT OF CHILDREN: Theodore LeBoutillier, M.D. (Arch. of Ped., May, 1925). The intravenous use of distilled water has been employed for some time in massive doses, though small quantities, as now given, have produced speedy and spectacular results in many cases.

There is a distinct biochemical reaction, which takes place in the blood cells, though as yet our knowledge of blood chemistry is not far enough advanced to demonstrate all the changes which take place. In the author's study of 200 patients at the time of and 24 hours after treatment, he has found that the average increase of red cells is 115,000, which increase persists for over a week. There is no increase or change in the white cells, but an increase of from 2 to 4 per cent in hemoglobin. When coagulation time of the blood is prolonged, following an injection, within 12 hours, coagulation time will be reduced from three to six minutes. In so-called acidosis and normal or hypernormal children, within 24 hours, the CO₂ content of the blood will change remarkably. In children with a normal CO₂ content, there was no change, while when the CO₂ content was above normal, i.e., around 67, there was a reduction to normal in 24 hours.

Ordinary tap water, which has been distilled three times, is used. The water should be freshly prepared and used within three or four days at the most. The dosage employed varies with the age and condition of the patient, from one-half to one and a half c.c. being given intravenously, or two to three c.c. intramuscularly.

In a chronic or subacute condition, one treatment a week will be found all that is required, while in acute cases the treatment should be given at about two- or three-day intervals until a maximum result is obtained, at which time they should not be given more frequently than at weekly or two-weekly intervals.

The results obtained in 22 cases of acidosis, some of them associated with cyclic vomiting, have been very remarkable.

The action of triple distilled sterile water is by hemolysis. There is a breaking down of a proportionate number of red cells, liberating their contents into the blood streams. The absorption of their contents by the tissues, starting an acquired immunity. The production of a slight increase in red cells; a general tonic action, which, in many cases, is marked. There is often a startling improvement in cases where there is nerve involvement or when the disease is of nervous origin.

R. N. ANDREWS, M.D.

APPENDICITIS AND LESIONS COMPLICATING ITS DIAGNOSIS: DEDUCTIONS FROM X-RAY EXAMINATIONS: Samuel B. Childs, M.D., Denver, Colo. (Radiology, 1925, 4, 107). The use of x-ray as an aid in the diagnosis of acute appendicitis is seldom advisable except for the exclusion of calculi or a pneumonia which may be entirely responsible for symptoms referred to the appendix area. In chronic cases, however, the x-ray visualizes certain abnormalities and a fluoroscopic examination is essential. Consideration is here given only to pathology in the appendix, associated with definite symptoms closely simulating those produced by stomach or duodenal ulcer or disease of the gallbladder. In some of these cases there is no history of acute appendicitis, but the removal of the appendix by completely relieving symptoms demonstrates that pathology in the appendix was their cause.

Several writers have emphasized the following cardinal points as indicative of diseased appendix:

- (1) Visualized appendix constantly tender to palpation—considered one of the most reliable signs when tenderness is limited to right iliac fossa.
- (2) Persistent kink or angulation—generally due to adhesion or short mesentery.
- (3) Delayed emptying.
- (4) Bulbous tip with small lumen near the cecum. This type usually shows delayed emptying.
- (5) Fixation by adhesions at tip or throughout entire length, pathologic but not sufficient evidence for removal.
- (6) Concretions—considered contributory evidence.
- (7) Segmented appendix—not a reliable sign. These signs are arranged in order of reliability. Indirect evidence includes pylorospasm, delayed motility of stomach, ileal and colonic stasis, occasionally spasticity of colon.

Co-existent lesions complicating the diagnosis are rather numerous, e.g.: tubo-ovarian disease, calculus in kidney or ureter, duodenal or gastric ulcer, cholecystitis, Lane's kink, Jackson's membrane, diaphragmatic pleurisy, dilated cecum and ascending colon, cancer and tuberculosis of cecum, mesenteric lymphadenitis and affections of the spinal nerves. The diagnosis of these conditions is very important in order that they, as well as the appendix, may have surgical treatment if indicated to effect permanent relief from symptoms.

In over 70 per cent of cases the appendix is visualized when barium is taken by mouth. Probably some of the unvisualized appendices are post-cecal. The diagnosis of chronic appendicitis without visualization is unwarranted and unreliable.

The following routine method is recommended: Take complete history relative to gastro-intestinal tract. If symptoms suggest possible existence of calculus in kidney

or ureter, films of those areas should be made. Films should also be made of the gallbladder area prior to a barium meal. The cæst should be examined by the fluoroscope, especially for adhesions of the diaphragm or for cardio-vascular changes. After the barium meal, fluoroscope the stomach and duodenum. After six hours the patient should return to determine any delayed motility of the stomach and evidence of stasis in ileum or other abnormalities of small intestine. Patient should return for 24-hour and 48-hour examinations and afterward, if necessary, to determine emptying time of the appendix and cecum. Both should normally empty at the same time. A post-cecal appendix at times is visualized only after the cecum has emptied and when the tip points upward it is usually held by adhesions and produces symptoms.

JAMES CUTHBERT, M.D.

RONTGENOGRAPHIE DER MÄNNLICHEN HARN-ROHRE (Frumkin. Fort. a.d., Geb. d. Röntgen., v. 33, p. 401, Apr., 1925). The author uses a 25 per cent solution of sodium bromide injected by a large glass syringe. 50 to 100 c.c. is used and in some cases a small amount of 3 per cent cocaine must be first injected. Plates are taken with the patient prone, but rotated slightly to one side, the tube entering between the thighs. No ill effects were observed.

The primary indication for the examination is stricture of the urethra. It makes possible the visualization of the urethra beyond a severe stricture. True, traumatic, and false diverticulæ of the urethra are clearly outlined. Operation may frequently be avoided by utilizing the information gained by this method.

LEO C. RIGLER, M.D.

PHYSICIANS LICENSED AT THE APRIL, 1925, EXAMINATION TO PRACTICE MEDICINE AND SURGERY IN THE STATE OF MINNESOTA

UPON EXAMINATION

<i>Name</i>	<i>School and Date of Graduation</i>	<i>Address</i>
Allison, Ernest Fridolf.....	St. Louis U. Sch. of Med., M. D., 1924.....	Minneapolis, St. Barnabas Hospital.
Bakkila, Henry Elmer.....	U. of Minn., M. B., 1924.....	Duluth, St. Mary's Hospital.
Dungay, Neil Stanley.....	U. of Minn., M. B., 1925.....	Northfield, Minn.
Fischer, Mario McCaughin.....	U. of Minn., M. B., 1924.....	Duluth, St. Mary's Hospital.
Gay, James Gaston.....	Johns Hopkins, M. D., 1923.....	Rochester, care Mayo Clinic.
Lund, Arthur Edward.....	Rush, 4 yr. Cert. Med., 1924.....	St. Paul, care St. Luke's Hospital.
Morehead, Oliver J.....	U. of Minn., M. B., 1925.....	Minneapolis, care General Hospital.
Palmer, Reuben N.....	U. of Minn., M. B., 1925.....	Chisago City, Minn.
Rasmussen, Carl Christian.....	Northwestern, 4 yr. Cert. Med., 1924	Minneapolis, care Swedish Hospital.
Smith, Newton Dean.....	U. Buffalo, M. D., 1923.....	Rochester, care Mayo Clinic.
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MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association
Northern Minnesota Medical Association and Minneapolis Surgical Society*

VOL. VIII

SEPTEMBER, 1925

No. 9

CLEFT LIP AND PALATE: THE CORRECTION OF LATE DEFORMITIES RESULTING FROM NEGLECT OR IMPROPER TREATMENT*

ROBERT EMMETT FARR, M.D.
Minneapolis

The anguish resulting from the birth of a child with cleft lip and palate is most distressing. This is true even though these deformities are corrected in early childhood—an achievement demanding special training, judgment and the highest type of surgical skill. In cases in which neglect or varying degrees of failure follow attempts to restore the deformed parts to normal, this torture not only continues to haunt the relatives of these unfortunate individuals, but, all too soon, they themselves begin to feel the pangs and continue to suffer until proper restoration is accomplished. Unfortunately, this suffering is accentuated as the patient approaches maturity and becomes more able to appreciate the “slough of despond” in which he finds himself. The fact that most parents are prone to consider themselves, in some mysterious manner, directly responsible for their offspring’s misfortune serves but to increase their sorrow and to foster the hope, in not a few instances, that such a child may not reach maturity. That many of these children do not survive long unless properly treated is also well known.

The acquiescence of parents to operative procedure is usually easily obtained, provided hope is extended to them. Thus the physician who first comes into contact with cases of this nature is confronted by an obligation of the greatest importance. In giving advice, it is obviously his duty to instruct the child’s sponsors regarding the possibilities presented by surgical art to cope with these conditions. He should, therefore, be prepared not only to advise surgical restoration, but

should likewise be willing to submerge any selfish interests with which he may be inspired, for those of the child and diligently attempt to place the unfortunate babe in the hands of someone who is well equipped to properly make such restoration.

The comparative rarity of these conditions, abetted by the willingness of the average surgeon in general practice to accept them for treatment, results in three main outstanding sequelæ: (1) through lack of special experience, a poor or at least a mediocre result is likely to obtain; (2) poor results have an inhibitory effect upon those in charge of the afflicted in the territories in which they live; (3) the acceptance of such cases by those who are unprepared to properly treat them necessarily decreases the opportunity for obtaining experience by surgeons who have special adaptability and training for this class of work, thus lowering the general efficiency of the profession.

It is also most unfortunate that after primary surgical failure secondary operations are made much more difficult. This is accounted for by the advance in the patient’s age, the presence of scar tissue, the lessening of the amount of soft tissue resulting from contraction, interference with nerve and blood supply and loss by excision of tissue at any primary operation. Sloughing may also be an important factor.

PRINCIPLES INVOLVED

Cosmetic and functional eventualities are the important desiderata. The cosmetic result will depend upon the readjustment of the separated segments of the superior maxillæ and the soft tissues of the lip. Function will depend largely upon closure of the palate, its length, the application of orthodontia and subsequent speech tutelage.

Unfortunately, there is some disagreement among those of wide experience regarding the management of complete clefts. As this message deals more particularly with my personal experience, references to the methods which I have found most satisfactory will be made as the different phases of the subject are developed. A symmetrical, well-

*Clinical talk presented at the 57th Annual Meeting of the Minnesota State Medical Association at Minneapolis, April 27-29, 1925.

shaped nose, a comely lip and a long, flexible, well-functioning palate are the chief objectives. As the obtaining of these ideals comprehends an inter-relation of each one with the others, they cannot well be discussed separately.

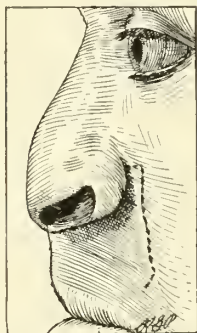


Fig. 1. Shows nasal depression with shortening of the columella in the adult. Also outline of flap for new columella. Compare with Figures 3, 4 and 8.

My experience shows that about one-half of the cases of cleft lip and palate that I have been called upon to treat have passed the period of infancy and that the lip, at least, had been operated upon. In a fair percentage of cases had one or several attempts also been made to close the palate. In no case in which the lip only had been closed in infancy (with the exception of those of the tripartite type) was the nose found to be symmetrically placed. In most instances, in addition to its lateral deviation, one side was found to be depressed, the direction of the long axis of one nostril was found to be asymmetrical with its fellow, the lip was thin and not infrequently too short and "notched" and the alveolar borders were found separated to a greater or lesser degree. In a number of cases, patients whose lips only had been united in early infancy (one to three weeks old) the patient on admission could place the point of his index finger between the alveolar borders and the lateral bony segments of the palate were found widely separated, especially posteriorly. The segment to which the premaxilla was attached, as a rule, projected anteriorly far beyond its fellow and carried with it forward and laterally the nasal septum. The condition and amount of tissue which might be employed in closing the palate was usually found dependent upon the number of attempts at closure that had been made and the amount of soft tissue which had been removed when making these repairs or had sloughed following the attempt. Failure to narrow the bony

diastasis in early infancy usually increased the difficulties encountered. A view of the patient in profile usually showed an extremely thin upper and a projecting lower lip giving the familiar "fish-mouth" appearance. The silhouette of such a case was as a rule even more hideous in instances in which the premaxilla had been removed or had been depressed too far posteriorly on account of the marked diastasis of the osseous alveolar borders. Depression of the tip of the nose with only a rudimentary columella was found all too frequently, especially in the tripartite type (Fig. 1).^{*} It may be of some significance to note that in but a small percentage of these cases had the methods of Brophy, as outlined by the writer in a recent article, been carried out. This small percentage consisted of patients upon whom the writer had previously operated and in each instance failure had been due to faulty technic, to-wit: some variation from Brophy's teaching. Our greatest difficulty in obtaining the desired result has been in our inability to overcome the depression of the tip of the nose with its accompanying shortening of the columella. Next to this our greatest trouble has resulted from failure to obtain firm bony union between the separated bony segments. This is entirely a technical matter and is due to failure to denude the bone so that cancellous tissue may be approximated or to failure to maintain the bones in position for a sufficient length of time by the means of silver wires and lead plates as recommended by Brophy.

TREATMENT

In considering the treatment of these conditions it may be well to refer more particularly to the individual defects.

The Nose.—In the late cases in which the bony diastasis was great we have not hesitated to fracture the alveolar process upon the projecting side by driving a chisel posterior to the second canine tooth. The muco-peristeam is then deflected downward towards the mouth and the bony surfaces of the alveolar process and the premaxilla firmly united by means of silver wire. This procedure will usually bring the tip of the nose to the midline, but in order to complete nasal symmetry it may be necessary to fracture the nasal bone and hold it in an overcorrected position either by intra-nasal means or by means of a splint (Fig. 2).

^{*}See also Figures 4, 8, 11 and 12.



A



B

Fig. 2. Shows O. D. before and after fracture of the nasal bones and alveolar process. Note wooden splint in A and nasal symmetry in B.

The size and direction of the nasal openings may be made to correspond by means of a plastic operation on the soft tissues. The elevation of the nasal tip carrying with it, as it does, the necessity for the elongation of the columella may present considerable difficulty. The simplest procedure is to raise a pedicle flap from the center of the upper

lip which is to be followed by the closure of the remaining defect. However, the tissue at the center of the lip may, on account of scar formation, be of such nature that some other field must be invaded in order to obtain a flap. Figures 3, 4, 5, 11 and 12 show methods of using a pedicle flap from a part of the cheek or lip. In case the nose

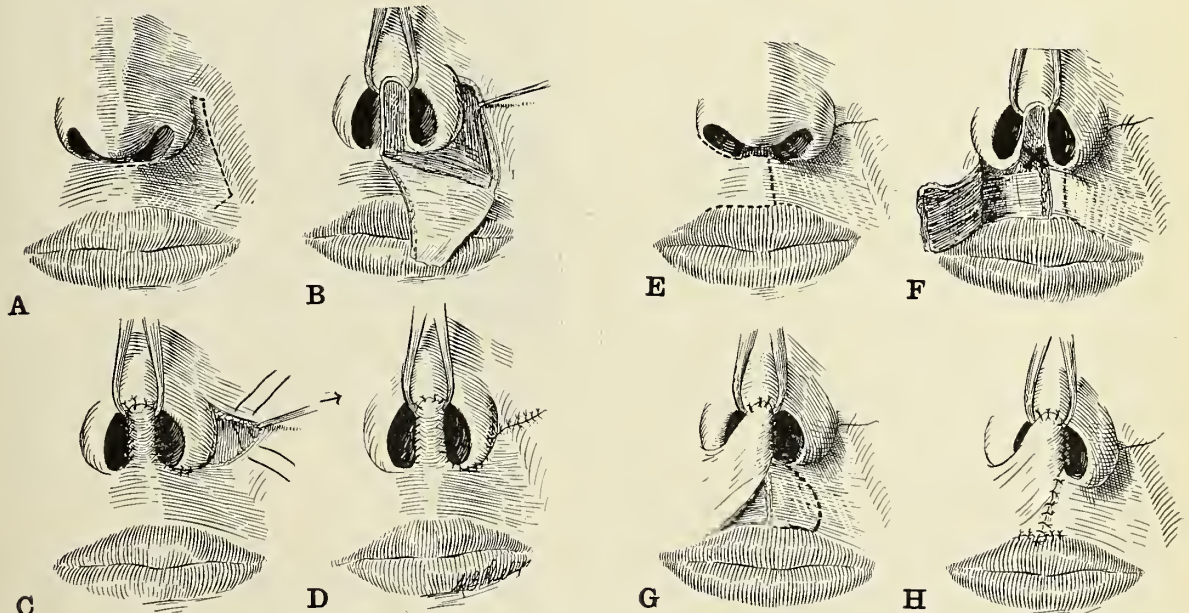


Fig. 3. Shows two methods of obtaining a new columella. (A) Outline of flap from cheek; (B) Flap dissected free, nasal tip elevated; (C) Nasal flap sutured into position; (D) Suture complete; (E) Outline of flap from lip. (See Figures 8 and 12.) (F) Flap dissected free, nasal tip elevated. (G) Flap sutured into position. Compare with Figures 5 and 7. (H) Suture complete. (See Figures 5 and 7.) (X) Point of division of nasal septum when necessary.

cannot be elevated sufficiently without it, we do not hesitate to divide the septum vertically at the lower end close to its origin (Fig. 3-FX). In suturing the defect in the cheek (Fig. 3-BC) a transverse line of closure is made in order to avoid



Fig. 4. Shows O. E., a neglected case, on examination. Note thinness and notching of lip and absence of columella.

drawing the nose to one side. In securing the flap from the lip (Fig. 3-EFGH) the skin only is raised and the lower incision follows the muco-cutaneous junction (compare with Fig. 5). In any case soft rubber tubes are placed in the nose and anchored to the forehead with silk-worm gut mattress sutures which are tied over gauze buttons (Fig. 6). In addition the implantation of cartilage or celluloid may be found necessary in order to maintain an elevated position of the tip of the nose. In the case of O.E. (Fig. 8) celluloid was used. (See also Figures 4, 11 and 12.)

The Lip.—The conditions most often presenting in these cases were as follows: The lip was not of sufficient length or thickness, notched, asymmetrical, inverted, retracted or, as in Figure 9, contained a fistulous opening. In overcoming these defects one must have in mind certain objectives.

Overcorrection describes these, perhaps, as well as any discussion could. Technically, one should not hesitate to divide the lip boldly, preferably along the lines of the old scar, which should be excised, and to thoroughly mobilize the segments by making incisions along the normal physiological lines. These are, an extension at the angle of the mouth, along the base of the nose, around the ala or along the "laughing" wrinkle. By so doing, a minimum amount of scar will result and the lip may be shaped as desired. Thickness may be obtained by the method shown in Figure 10, and Figure 11 shows the manner of applying the sutures (see also Fig. 12). With or without appropriating tissue from the cheeks one may evert the mucous membrane after excising a v-shaped piece of skin just above the muco-cutaneous border.



Fig. 5. Shows B. D. after healing of flap (Figure 3H) into position.

The Palate.—In children who have not as yet erupted their permanent teeth the closure of the palate is much simplified by the preliminary extraction of the deciduous set. It is then possible, after a delay of three or four months, to utilize

the tissue from the gums or the cheeks in case the necessity arises. Extreme care in elevating the soft parts, broad approximation of surfaces by horse-hair sutures, lengthening the soft palate, the avoidance of tension by the use of fine annealed silver wire and lead plates and vigilant after-treatment are most important considerations.

In children past fourteen and in adults we have used local anesthesia in repairing the palate and find it to be of decided advantage. One has the patient's co-operation and the infiltration offers an aid in elevating the flaps. The lungs remain clear.

In all cases, whether in children or adults, the healing of the palate will depend, not only upon a minimum amount of traumatism inflicted during the mobilization, but upon the presence of localized or generalized infection in the individual at the time of operation. Young children or infants should be detained in hospital for several days before operation for observation, as acute infections are especially apt to be picked up by them while traveling. In older patients, malaise, elevation of temperature, leucocytosis or congestion of the mucous membranes or the naso-pharynx should be sufficient to cause one to defer operation until a normal condition of health is assured.

In palates in which no previous effort at repair has been made, and in which bony diastasis has been overcome, lateral incisions are, as a rule, un-

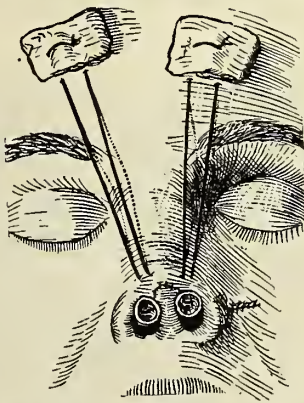


Fig. 6. Shows method of retaining nose in elevated position during healing.

necessary. The vital point in making the separation between the bone and the muco-periosteum lies at the junction of the hard and the soft palate. The elevation should be begun along this line and should be preceded by a short incision with a sharp

scalpel. Through this incision the elevator is introduced and under the guidance of the eye and finger sensation, its point is made to follow the bony surface lateralward and just posterior to the origin of the last molar on each side. A special

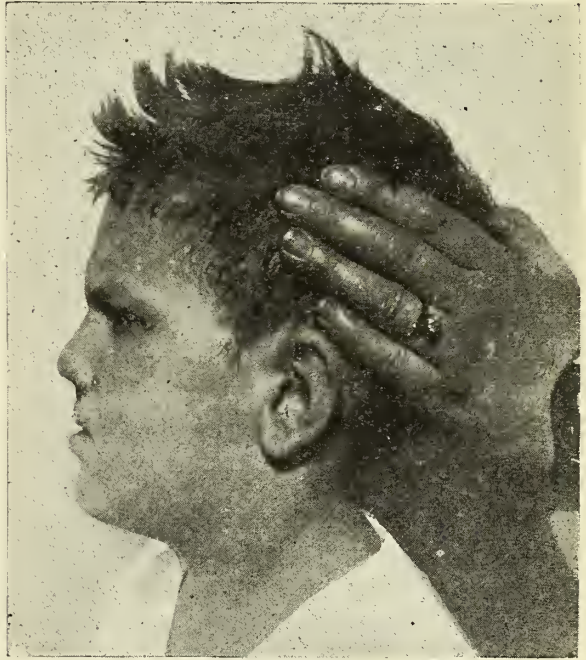


Fig. 7. Shows a fair lip and a perfect nose after the operation shown in Figure 3-EFGH was performed. (See also Figure 5.)

effort is required in order to prevent the tip of the elevator from perforating the mucous membrane just posterior to the last molar, as such perforation usually portends possible injury to the blood or nerve supply, so important to this region. Curved elevators with large handles serve the purpose best and not infrequently the forcing of a small sponge between the bone and muco-periosteum will serve not only to arrest hemorrhage, but will allow one to separate the tissues with the least amount of trauma. Posteriorly the edges of the soft palate should be split rather than pared, a pointed knife being used for this purpose. In this manner the soft tissues may be conserved. We would even advise the splitting of each half of the uvula by a continuation of the incision backward. Anteriorly, the mesial borders, which will be found somewhat ragged and irregular, may be pared slightly and the elevation should be so complete that the soft tissues will overlap at least 1 cm. without tension. Two or three fine silver wire tension

sutures are now introduced by means of leaders of loops of fine linen or silk thread upon sharp curved fine needles. It is our custom to pass one



Fig. 8. Shows O. E. after the operation as shown in Figure 3-ABCD was performed. In this case it was necessary to insert celluloid in the nose to maintain the tip in an elevated position.

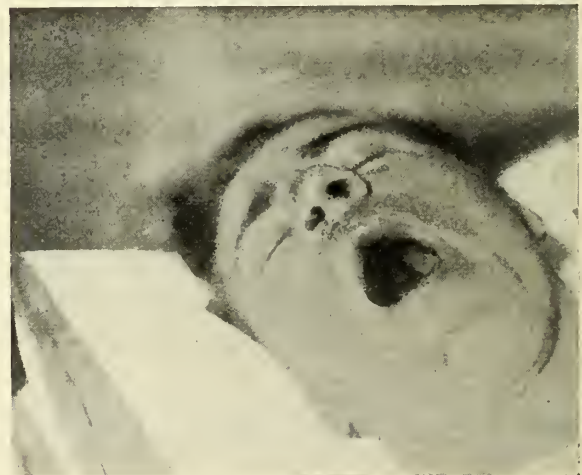
fine silver wire far posteriorly through the glosso-pharyngeal muscles. About 1 cm. in front of this a double wire is passed and a single wire is then placed anteriorly with about the same spacing.

Provided the soft tissues have been sufficiently freed and the soft palate split rather deeply, it will be found that a broad approximation can be made posteriorly by the means of sutures. The upper or nasal border is united by means of a continuous fine chromic gut suture, the oral border by horsehair. Other things being equal, the healing of the anterior half of the palate will depend upon the broad approximation of the lateral surfaces. This is best accomplished by means of a continuous mattress or right-angled suture which everts the mobilized borders toward the oral cavity. After the introduction of this suture the everted edges may be united by fine interrupted horsehair stitches.

After the construction of the palate is complete the wire tension sutures may be adjusted over lead plates. One of the central wires is united by torsion to the posterior, the other to the anterior wire. After torsion is begun the twisted ends may be grasped by means of a fine needle holder or artery forceps and the wires brought to the proper tension. Brophy states that this device not only relieves the tension on the central lines of suture, but in addition acts as a splint for the newly formed palate, puts the glosso-pharyngeal muscles out of commission for the time being and furthermore prevents the patient from forcing the tongue against the palate on account of the unpleasant sensation produced by the protruding ends of the wires.



A



B

Fig. 9. Shows O. A. (Lip only operated upon in early infancy). A shows a lip fistula with a probe inserted and the thin notched lip which is so commonly seen. B shows the asymmetry of the nose met with in these cases of a complete cleft which has been neglected in infancy.

In younger children postoperative tube feeding through the nose is desirable. An antiseptic mouth wash is to be recommended. The portion of the

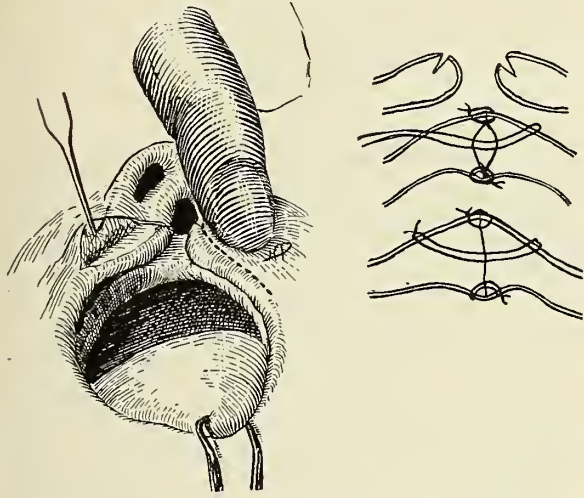


Fig. 10. Shows the method of splitting the lip which has certain advantages at times over the paring operation. The insert shows the method of suture.

palate which is most liable to give way is the central part and in case of partial failure one should not be too hasty in attempting secondary repair. The central opening has a marked tendency to contract and in many instances will close spontaneously if given time. Secondary operations require an enlargement of the opening, generous denudation of the borders, lateral incisions and an absence of tension. Obdurators, as a rule, are inimical to later success and should not be worn in

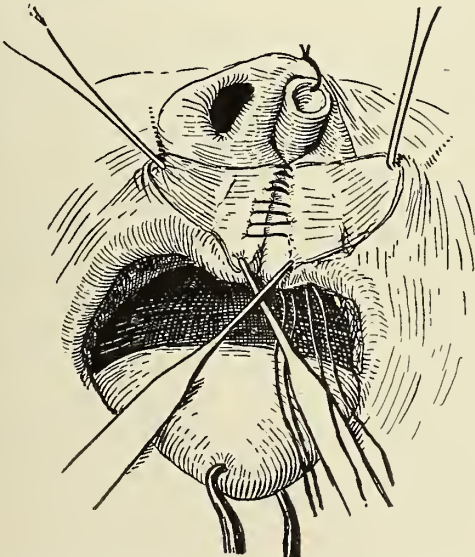


Fig. 11. Shows the mucosa closed by mattress sutures. The skin should be closed by horse hair.

case there is a possibility of closing the opening.

It is essential in all cases to begin treatment by obtaining the consent and co-operation of the patient or his sponsors and this can best be done by two methods of procedure. In the first place they must understand that failure or partial failure is not only possible but probable, and in the second place that there will be no extra expense connected with further operations should they be necessary. The charging of a lump sum for the management of a case has been a most excellent means of bringing patients back for secondary operations when these were found necessary.

SUMMARY

The physician who first comes in contact with a case of cleft lip or palate should be prepared to offer proper advice concerning its management.



Fig. 12. Shows the great amount of thickening that can be accomplished by this method. Compare with Figures 4 and 8.

Early bony restoration is one of the prime essentials of treatment.

The preliminary closure of the lip, while aiding in restoring the bones to normal position, usually fails to fulfill this function. Too often it results in a thin lip and quite obviously cannot result in bony union of the alveolar processes.

The premaxilla should never be removed and its displacement too far backward should be pre-

vented by a narrowing of the alveolar processes in infancy.

The necessity for overcoming late defects will gradually disappear as the realization of the above points becomes manifest.

Overcoming these late defects offers to the plastic surgeon the utmost difficulty and necessitates some plans of procedure like those enumerated in this paper.

As a rule, both functional and cosmetic results will depend directly upon the application of the proper treatment at the appropriate age, but even in neglected cases, or in those in whom the results have been unsatisfactory, much may be accomplished by plastic surgery combined with great patience and perseverance.

LOESER'S INTRAVENOUS SOLUTION OF SODIUM THIOSULPHATE NOT ACCEPTED FOR N. N. R.

Loeser's Intravenous Solution of Sodium Thiosulphate (New York Intravenous Laboratory) is marketed in ampules of 10 c.c., said to contain 1 gm. of sodium thiosulphate, U. S. P. The Council on Pharmacy and Chemistry reports that, according to the advertising, this preparation is to be used in "arsenical dermatitis, mercurial stomatitis, bichlorid poisoning, skin diseases," and "Arsphenamin Dermatitis, Metallic Poisoning, Skin Diseases." The Council explains that whereas the tenor of the advertising is to the effect that the use of thiosulphate in these conditions is supported by equal evidence, this is essentially misleading; for the evidence of its efficiency against arsphenamin dermatitis is very much stronger than that for other "metallic toxemias." The Council cautions that reliance should not be placed on thiosulphate in mercury poisoning to the neglect of other measures. The same caution applies to the use of thiosulphate in poisoning by other metals, except that the evidence for these is even more scanty. The Council calls attention to other claims of a general character which are likely to mislead. There is, in the first place, the general claim that the intravenous solutions of this particular firm are superior to those of other firms; but there is no evidence for such claims. Finally, but most seriously, this firm, through its house organ, *The Journal of Intravenous Therapy*, misrepresents the general status of intravenous therapy. Statements which are made in the firm's advertising are distinctly misleading as to the real field for intravenous therapy and serve only to discredit that method of administration. The Council finds Loeser's Intravenous Solution of Sodium Thiosulphate inadmissible to New and Non-official Remedies because misleading and unwarranted claims are made for it in the advertising of the New York Intravenous Laboratory. (*Jour. A. M. A., Apr. 25, 1925, p. 1289.*)

THE DICK TEST AND ACTIVE IMMUNIZATION AGAINST SCARLET FEVER WITH DETOXIFIED TOXIN*

WOODARD COLBY, M.D.

Miller Hospital Clinic

St. Paul

The recent findings in the study of scarlet fever lead to a firmer conviction that the disease is caused by a specific *streptococcus hemolyticus* and confirm the more recent conception of scarlet fever as a local infectious disease of the mucous membrane of the nose and throat.

Further, the disease is now conceived as a combined toxic and bacterial infection, the invading specific streptococcus producing locally a toxin which, upon absorption, gives rise to general malaise, nausea, vomiting, fever and rash. The mucous membrane of the nose and throat may permit of a bacterial invasion of the blood stream with gland, ear and joint infections.

The work of Dick and Dick,¹ Dochez,² Tunnicliff,³ Gordon,⁴ Bliss⁵ and others in isolating the specific streptococcus as the causative agent in scarlet fever, and the demonstrable production, as well, of the specific toxin by the Dicks,⁶ and later by Williams⁷ and her co-workers, has made possible a test for susceptibility and an active immunization when the toxin is used in dilution and concentration respectively.

The Dick Test.—The Dick⁸ test consists of an intradermal injection of .1 c.c. of a dilution of the soluble toxic filtrate of the specific hemolytic streptococcus. The toxin is produced by growing the streptococcus for five or six days in broth containing a small percentage of rabbit, sheep or horse blood serum. A preservative such as phenol or tri-cresol is then added, the sediment is allowed to settle and the supernatant fluid passed through a Berkefeld filter. The toxin is essentially stable (as compared with that used in the Schick test), its potency remaining unchanged though it stands for days.

The technic of the test consists of an injection of .1 c.c. of the proper dilution into the skin of the forearm. If the individual is susceptible, an area of erythema begins to develop at the site of the injection in about six hours, reaching its maxi-

*Read before the Minnesota State Medical Association, Minneapolis, April, 1925.

mum in about twenty-four hours. The redness varies in intensity from a faint pink to deep red. There may or may not be local induration.

Fading is usually rapid; many positives disappear in thirty-six hours and within forty-eight hours the local reaction in most cases has disappeared. Pigmentation and desquamation occur only in the very positive reactions. The local action is primarily on the capillary blood vessels, which explains its rapid development and transient character. Pseudo-reactions have been reported troublesome, although they can be practically eliminated when a correctly prepared solution of the toxin is used, and this does away with any need of the control test.

Practical Application of the Dick Test.—Of fifty-seven children tested in private practice, forty-nine, or 86 per cent, gave positive reactions. Of 304 children tested in institutions, 153, or 50 per cent, gave positive reactions. Of 100 nurses tested, thirty-two, or 32 per cent, gave positive reactions. The reaction was found positive during the first two or three days of the rash and negative in convalescence. Our figures show in the first group the usual high percentage of susceptibility among children of the well-to-do.

The Dick test is a practical method for determining susceptibility and immunity to scarlet fever, and is an aid in diagnosing doubtful cases of the disease, since positive reactions early and later in convalescence throw doubt on a diagnosis of scarlet fever.

Immunization.—According to the method of Drs. Dick,⁹ immunity in susceptible individuals is established by subcutaneous injection of the toxic filtrate. The dilution of the toxin is usually such that 0.25 c.c. is equal to 125 skin doses, 0.5 c.c. 250 and 1 c.c. 500. This is given in the above increasing doses at intervals of one week. Three injections are usually needed, though a fourth and fifth have been required in some cases to establish immunity. Good immunity is demonstrable in most cases, however, about the tenth day after third injection. By means of this method we have injected forty-nine children with a resulting immunity in about 65 per cent. Zingher¹⁰ and Nesbitt,¹¹ in a large series of cases, have reported approximately the same immunity percentage.

Sodium Ricinoleate as Detoxifying Agent.—In collaboration with Dr. Larson, the author, in a

recent article,¹² made a preliminary report on a series of scarlet fever immunizations in which sodium ricinoleate was employed as a detoxifying agent. Dr. Larson^{13,14,15} has shown previously that sodium ricinoleate has the property of neutralizing bacterial toxins without altering their immunizing properties, and has immunized animals successfully against diphtheria and tetanus toxins by means of this agent. Extending his observations on bacterial toxins to scarlet fever, the author, by means of the addition of a solution of sodium ricinoleate to the toxin, has been able to give large doses with rapid immunity resulting.

The technic of the procedure consisted of the addition of an equal volume of 2 per cent solution of sodium ricinoleate to the toxin, where the final dilution equaled 4,000 skin test doses per cubic centimeter. Thus prepared, the toxin was allowed to stand at least four hours before injection. *One injection only was given.* Various sized dosage ranging from 500 to 4,000 skin test doses were used. No general reactions whatever and even negligible local reactions (erythema and mild induration disappearing within thirty-six hours) were experienced. Children between the ages of two and fourteen with positive Dick reactions were used in this series.

DOSE	NO. OF CASES	DAY OF RETEST	PERCENTAGE
			NEGATIVE
1,000	18	5th	48
1,500	31	7th	66.6
2,000	44	8th	68.5
3,000	18	8th	87
4,000	21	8th	90
	132	21st	96

NURSES			
2,000	16	17th	37.5

Note: The detoxified toxin was prepared by Dr. W. P. Larson.

Discussion.—That immunity is established in direct ratio to the amount of toxin given has been shown by the series. In order to still further increase immunity, the dosage has been safely increased to 6,000-8,000 skin test doses. For children under ten years of age our observations indicate that 4,000 skin test doses are sufficient. In older children and adults a higher dosage is required, as was demonstrated by the low percentage

of immunity obtained in the series of nurses, where but 2,000 skin test doses were used.

CONCLUSION

(1) The single injection method is a marked advantage in dealing with children.

(2) Local and general reactions are negligible.

(3) The toxin-soap solution never dissociates. With scarlet fever toxin-antitoxin it often does, with a resultant toxic mixture.

(4) Rapid development of immunity makes possible active immunization of members of a family where a case of scarlet fever has developed.

(5) Active immunization of individuals in a scarlet fever epidemic is possible.

(6) Active immunization will probably preclude the possibility of a severe epidemic of scarlet fever.

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DISCUSSION

DR. E. S. PLATOU, Minneapolis: The work reported by Dr. Colby is extremely interesting, particularly the phase that he spoke of last. About nine months ago we undertook in Minneapolis the use of Zingher's toxin. We tested about 500 cases. The result of that work was more or less in accord with what has been found previously, that the test is very valuable both as an indicator of immunity and as an aid in diagnosis. Of eighty-six cases that have been immunized with that preparation, fifty-four were re-tested and forty-seven were immune in six to sixteen weeks. Two of these apparently lost their immunity.

A second thing which I think is very important at the present time is the fact that the test is read in twenty-four hours. I believe that for the practitioner this is particularly valuable because we can use the antitoxin which is on the market at the present time for passive immunity. I think that the work on Dr. Larson's preparation is very valuable, and that with more cases we can have something more to say about it.

DR. E. J. HUENEKENS, Minneapolis: I have also been able to do some of this work in the past eight or nine months with toxin that I obtained from Zingher of the New York health department. My test series here of fifty cases were done with a very low dilution of toxin, such as was advised by Dick in the beginning, that is, 100, 250 and 500 skin test doses. Of those that were Dicked from one to two months later, five out of the fifty were positive; the rest were all negative. This is a higher percentage of negatives than is given by any other experimenter with this work, but practically all of these are in private practice and on children of pre-school age, where we are likely to produce immunity much more readily. Six months later I have been able to re-Dick some of those cases that were negative, and of those who were negative previously four had become positive again; that is, they had lost their immunity in that time.

There are two points I want to make about that: First, that during those six months practically all these children were immune to scarlet fever. It just happened that two of those fifty children who were negative were intimately exposed to scarlet fever during that time. One of them played all day with a child with a sore throat who that night came down with scarlet fever; and this boy who had been immunized did not get it. However, we cannot count on this immunity as lasting.

I want you to remember, though, that this immunization was done with this very low dosage. Now, with the work that Dr. Larson has done we will be able to multiply that dosage by twenty-five and even fifty times and still not get as much of a reaction as I got in some of these cases with a very small dosage. In three of these cases beginning

with 100 skin test doses I got a skin rash which looked very much like scarlet fever. In none of these cases did I get any very serious reactions, but enough so that the parents were a little bit alarmed about it. In about twenty-five cases that I have been able to do with 2,000 and 4,000 skin test doses used with Dr. Larson's method, we have got no reaction of any kind whatever, even though using twenty-five times the dosage.

Now, I agree with Dr. Colby that this new method of using the bigger doses is going to make Dick's work much more valuable in that in certain cases we can immunize other members of the family who are exposed to scarlet fever, partially immunize them, at least, in three or four days. In those twenty-five cases that I did with Dr. Larson's method, in four days after giving the 4,000 skin test doses we changed the reaction from a double plus Dick to one that was doubtful. There was still some reaction, but it had become very faint, and within one to two weeks the Dick had disappeared altogether.

Now, that is an important thing, but looking at this from a public health standpoint a still more important feature is that if we are able to use these bigger doses of Dr. Larson—perhaps even bigger than the 4,000 skin test that have been tried—and if we can give these in repeated doses such as Zingher is now using—four doses I think is his limit—we might produce a permanent immunity that so far we have not been able to produce.

DR. W. P. LARSON, Minneapolis: I may say that sodium ricinoleate is nothing more or less than a highly purified castor oil soap. The work of neutralizing bacterial toxins with castor oil soap is the outgrowth of work which was started in the Department of Bacteriology and Immunology some years ago. In 1919, and in several papers since that time, we have called attention to the effect of the surface tension of the medium on bacteria. We have been able to show that the surface tension of the medium influences the growth and pathogenicity of bacteria to a marked degree. The pneumococci and streptococci are very sensitive to surface tension depressants. They are killed in a few seconds when placed in a 1 per cent solution of castor oil soap.

Something like a year ago we published a paper on the effect of the surface tension on bacterial poisons. At this time it was pointed out that such powerful bacterial toxins as diphtheritic toxin and tetanus toxin were instantly neu-

tralized when added to the appropriate amounts of sodium ricinoleate. In fact, it is possible to so neutralize the toxins that several hundred fatal doses may be given without ill effects. The fact that the animals thus treated become immune to the toxins in question is evidence that the toxins have not been destroyed or materially changed otherwise. It seemed, therefore, that advantage might be taken of this observation in our efforts to immunize children against diphtheritic and scarlatinal toxins.

In collaboration with Dr. Eder of this city we have treated about 150 individuals with diphtheritic toxin neutralized with sodium ricinoleate, and, while it is too early to speak of the final result, we find that more than 50 per cent of the cases give negative Schicks within six weeks following a single injection. The results with scarlatinal toxin neutralized with sodium ricinoleate are even better, as is shown by the excellent piece of work reported by Dr. Colby.

We are naturally very much interested in the mechanism of the reaction. From investigations we have carried out in an effort to analyze the reaction it appears that the detoxification is an adsorption phenomenon. The toxin molecule apparently adsorbs the sodium ricinoleate onto its surface, becoming imprisoned, as it were, so that the toxin is not free to react with the tissues. The toxin is probably liberated slowly and in this way we have a continued antigenic stimulus over a considerable period of time.

Neutralizing the toxin with sodium ricinoleate has an obvious advantage over the toxin-antitoxin mixtures, since the latter tend to sensitize the child to horse serum, which is a decided disadvantage. Since it is possible to neutralize the toxin effectively with castor oil soap and possibly effect the immunization with one dose, the main objections to active immunization against diphtheria and scarlet fever will fall away.

DR. WOODWARD COLBY (closing): In immunizing against scarlet fever we have had best results with neutralized toxin. As a detoxifying agent sodium ricinoleate has been very satisfactory. Local and general reactions are few and slight. The large dose of toxin gives a rapid immunization. With this method a family may be quickly immunized where a case of scarlet fever develops. In dealing with children a one-injection method has decided advantages.

Whole Grain Wheat.—The guiding force behind the Whole Grain Wheat Company seems to rest in its president, C. H. Woodward, whose name appears extensively in the advertising. The company's advertising methods are ingenious and many. In addition to advertisements in the ordinary channels, newspapers, etc., the Whole Grain Wheat concern publishes a number of booklets and pamphlets, and gets out a monthly house organ called *The Motive*, which has C. H. Woodward for its editor and publisher and chief contributor. Also, the concern, apparently, organizes so-called "food clinics" in various towns and has as a subsidiary advertising organization the high-sounding "Amer-

ican Educational Food Council." This "Council" appears to be a mere "paper" organization.

Woodward argues that the cure for all disease is Whole Grain Wheat because it is *not* denatured, and will make up the deficiencies of the denatured food on which a crazy world is feeding. We are told that Whole Grain Wheat has cured such serious diseases as cancer, tuberculosis, Bright's disease, diabetes and colitis, as well as such conditions as "catarrh," constipation, asthma, bed-wetting in children, etc. So much for the exploitation methods of the Whole Grain Wheat Company. As to the product itself, it is, apparently, nothing more than whole grain wheat, partly cooked. (Jour. A. M. A., May 9, 1925, p. 1441.)

MEDICAL AND RADIOLOGICAL MANAGEMENT OF HYPERTHYROIDISM*

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In the treatment of hyperthyroidism there is, strictly speaking, no sharp boundary line between treatment by medicine, surgery or radiation. The average case must have medical attention combined with either radiation or surgery and in some instances both.

The "general" medical factors in the therapy of hyperthyroidism, indicated in nearly all cases, are:

1. Rest, physical and mental.
2. Basic diet of high caloric value.
3. Iodinization.
4. Other medication (bromides, eliminants, hematinics, etc.).
5. General hygienic measures.
6. Eradication of foci of infection.

The "special" medical factors, indicated in the severe cases, depending upon the variety and severity of the symptoms presented, are:

1. Proper hospitalization to procure the maximum of physical rest, and psychic isolation and control.
2. Pronounced sedation (bromides, chloral, and opiates).
3. Digitalization.
4. Ice packs to thyroid gland and precordium.

Some cases of adolescent hyperthyroidism, which condition may be looked upon as a compensatory process run amuck, mild cases secondary to focal infection and infectious diseases, and even mild cases presenting Basedow's syndrome, may be brought to recovery by the utilization of the above-mentioned "general" therapeutic factors.

The vast majority of cases, however, need treatment to inhibit thyroid hyperfunction, which can be obtained only by radiation or surgery.

It is not the intent to discuss here the *modus operandi* of radiation in detail, nor to compare its merits with those of surgery, but merely to state the conviction based on personal experience with ninety cases and upon the published reports in medical literature that,

1. Equally good results can be obtained by radiation or surgery.
2. Surgery carried out by the most skillful masters has about 3 per cent mortality in cases of toxic adenoma, and 1 per cent in Basedow's disease when both varieties are most skillfully handled medically both before and after operation.
3. The average surgical mortality rate throughout the United States is about 10 per cent of all cases.
4. Radiation therapy has no mortality.
5. Radiation therapy is accepted earlier in the disease by the patient.
6. Radiation therapy has a distinct triumph in its ability to bring to a cure surgically dangerous cases, or to convert them into surgically safe ones.

With the increased knowledge of the biological effects of radiant energy, and a perfected instrumentarium with which to apply it, the administration has become almost an exact science. The dose can be duplicated at will with precision and, with the short wave length now available, allowing sufficient filtration, the danger to the skin and subcutaneous tissue is entirely obviated.

The success of radiation therapy depends, as in surgery, on a careful pre- and postoperative handling of the patient, and the elimination of a sufficient percentage of thyroid function. *Underdosage* in radiation has its surgical counterpart in the *insufficient removal* of thyroid structure, and, on the other hand, the *sub-total thyroidectomy* has its radiological brother, *adequate dosage*.

If the radiotherapist makes as his own the lessons that surgery can teach him, he has a distinct advantage over the surgeon in the treatment of hyperthyroid states that are so prevalent at this time.

It is not a question of radiation versus surgery. The fundamentals are the same, and the indications for application are identical. Indeed, in some cases the two methods supplement each other and in a few even complement each other.

Radiation of a thyroid is in reality a major surgical procedure requiring skill in its application, as does the open method, and should not be undertaken by anyone who has not an adequate clinical erudition and circumspection, aided by a clear conception of the physiology and pathology of the thyroid gland.

*Read before the Minnesota State Medical Association, Minneapolis, April, 1925.

It is so simple to turn on the x-ray, but this is another instance where "fools enter where angels fear to tread." Any old x-ray machine does not suffice to treat properly so important a condition as a severe hyperthyroid state. Aside from personal equipment there must be available as in surgery:

1. Up-to-date installation.
2. Adequate hospital facilities.
3. Laboratory facilities.
4. Trained personnel.

In order to touch briefly on the practical procedure in the management of the hyperthyroid states, I wish to enumerate and discuss each of the five clinical entities that manifest hyperfunction.

1. *Adolescent goiter with hyperfunction.*—Unless the toxicity is quite marked, it is a safe proposition to make use of the "general" medical factors above mentioned for a considerable period of time, taking advantage of the fact that in many instances at the approach of, or at the attainment of maturity, improvement is likely to take place spontaneously.

If the toxicity is pronounced, or if prolonged, even though of moderate severity, radiation is in order, but dosage should be moderate, in order that these young persons will not be robbed of too much of their thyroid gland. I have in mind a number of young women whom I have observed and treated in this manner some ten or twelve years ago, who have married since and have borne children without any manifestation of thyroid dysfunction up to the present day.

2. *Adenoma with hyperthyroidism.*—This condition is claimed by surgeons as their very own, in spite of the fact that the surgical mortality is three times as high as in the non-toxic variety and in Basedow's disease well treated medically prior to surgical intervention.

Unfortunately, iodination is of little avail here, for the purpose of temporarily reducing the high rate of metabolism. Toxicity of a low grade usually has existed for a long time, and changes in vital organs have taken place due to the prolonged, though mild, intoxication, which no doubt accounts for the high rate of surgical mortality.

Marked toxicity usually supervenes after a non-toxic or only mildly toxic adenoma has existed for many years. The goiter mass enlarges more or less suddenly, and pathologists tell us that the

increased tissue is composed predominantly of embryonic type of cell formation.

Embryonal cells are more sensitive to radiation than normal thyroid cells, and can therefore be made to retrograde by appropriate radiation without materially affecting the adjacent normal thyroid tissue.

When toxicity has disappeared or materially lessened after sufficient radiation the new growth, having become more or less localized and firmer, should be surgically disposed of. Adenomas that have increased very little in size at the advent of toxicity, but are firm and localized as before, should be dealt with surgically, as they are not suitable for radiation therapy.

3. *Malignancy of the thyroid gland with or without hyperthyroidism.*—Since I have no personal experience with this disease, I can only discuss it from the standpoint of malignancy in general, and from information gleaned from the literature. It is a rare condition, being found in far less than 1 per cent of all thyroid abnormalities. If a goiter in which there has been a recent growth shows fixation to the surrounding structure, with moderate tenderness and some pain, and the patient is in the cancer age, the diagnosis of malignancy is justified. In such a case radiation therapy of maximum dosage compatible with safety is indicated, in order to give the patient the only chance for life, or at least a prolongation of the same in comparative comfort.

If malignancy of an early stage is incidentally discovered at the time of operation for an adenomatous goiter, post-operative radiation of maximum intensity is indicated, even though all of the thyroid gland is destroyed by the treatment. The subsequent myxedema can be controlled by thyroid feeding.

4. *Thyroiditis with hyperthyroidism.*—The acute form of this condition is characterized by swelling, pain, tenderness, local heat, and rise of body temperature, and presents an alarming clinical picture. It usually follows or is a complication of an infection such as an acute tonsilitis, erysipelas, typhoid, or other infectious diseases. To the symptoms of inflammatory disease is added the acute thyroid intoxication. The "general" and "special" factors of medical treatment must be mobilized at the earliest possible moment to avoid disaster. If suppuration takes place, drainage

should be established. Whether suppuration takes place or not, I am of the opinion that a vigorous application of the ray is indicated. Radiant energy does counteract inflammatory processes, as is demonstrated in the treatment of a carbuncle, the course of which can be reduced to one-fourth of the usual duration by vigorous radiation.

I have a vivid recollection of two cases of thyroiditis, one complicating a mild typhoid in which the patient promptly died (no radiation), and another, the daughter of a physician, a delicate little lady with a pre-existing mildly toxic adolescent thyroid, who developed her acute thyroiditis following an acute and severe attack of tonsilitis. This patient was vigorously rayed in addition to strict medical management and weathered the storm. She was rayed again thirty days later, due to a residual thyroid over-activity with a basal rate of plus 54. She promptly recovered and is now free from thyroid difficulty.

The chronic form is to my mind undiagnosable clinically, but can only be suspected in the presence of an undoubted aggravation of thyroid function, when slight pain is complained of by patients who are *not in the cancer age*, and in whom definite foci or infection are demonstrable. The treatment suggests itself, and it is interesting to observe how often the removal of septic tonsils, drainage of chronic sinuses, or the extraction of bad teeth brings improvement in patients who are mildly thyrotoxic. The radiation, if needed, should be light and at short intervals, to influence the inflammatory process rather than the hyperfunction.

5. *Basedow's Syndrome.* — As stated before, mild cases of this condition are curable by purely medical management. But the vast majority need in addition inhibition of thyroid function, either by means of surgery or radiation. The surgeon naturally prefers surgery and the radiotherapist radiation, and both can accomplish the same results.

Patients with moderate toxicity can be treated ambulant by radiation without interruption of their daily occupation, and will submit to radiation earlier in the course of the disease than to operation. Consequently, the course of the disease is shortened, and much invalidism incident to tissue damage before operation is consented to is prevented.

The very toxic cases should have medical management for the first thirty days, during which the previously mentioned "special" medical factors should be employed and two radiations given. After thirty days most of the patients can be treated ambulant like the moderately toxic ones, but must not work, and usually need some sedatives.

The outstanding medical factor is iodination, which reduces temporarily the abnormally high rate of metabolism. It is astounding what benefit 15 to 30 drops of Lugol's solution each twenty-four hours will give. This practice, together with other medical methods, has reduced the surgical mortality in the hands of skilled surgeons to about 1 per cent where, without it, it was 3 to 4 per cent.

The use of iodine has been revived in recent years after having been "taboo" for about twenty-five years. Iodine in some form or other has been used in the treatment of thyroid diseases for fifteen hundred years or more, empirically, however, and not in the rational and scientific manner as now, for both prophylaxis and cure. Unfortunately, iodine medication is not effective over a longer period than about four to five weeks, but during this time of effectiveness enough thyroid tissue can be put out of commission, by either operation or radiation, to place the case well on the road to recovery.

The amount of radiant energy to be administered depends on the response to treatment in a given case. It should be administered in sufficient amount and repeated enough times to bring the metabolic rate to normal.

The average patient is treated every thirty days with basal metabolic rate reading preceding each treatment. When the rate nears the normal, which is usually in seventy to ninety days, the patient is observed for about sixty days without radiation. If the rate goes down to normal during this time, all is well; but if it is found that it still has a tendency to be above normal, radiation is repeated, but at longer intervals, until normal values are obtained.

In about 70 per cent of cases a cure is obtained. The other 30 per cent vary in their state of well-being from almost cured to chronic invalidism, depending upon the damage to vital structures from the toxicity of the past, or the complexity of the pluriglandular dysincrinism with which they are burdened.

Before June, 1924, I used roentgen radiant energy of moderate wave length, produced by 120 kv. crest, filtered with 0.25 mm. copper and 1 mm. aluminum. The focal skin distance used was 30 centimeters. The amount given was 120 mam. each over the right and left lobe of the thyroid and over the thymus area. This was effectual, but gave marked bronzing of the skin and in some cases a secondary skin change. Since the abovementioned date I use the short wave length, produced by 200 kv. crest, filtered through 0.75 mm. copper and 1 mm. aluminum at a focal skin distance of 50 centimeters. One large field including the neck and thymus area is exposed. The amount is 300 mam. Practically no bronzing takes place and never an erythema. The effectiveness is much greater than by the older technic, and fewer treatments are required even in the resistant cases.

CONCLUSIONS

1. Medical management is essential in practically all hyperthyroid states.
2. Radiation is an effective adjunct when appropriately applied, has no danger to the skin and has no mortality.
3. Patients readily accept radiation if it is offered to them, early in the disease, which prevents those profound intoxications from causing permanent tissue changes in vital organs.
4. Patients should have the benefit of the method as soon as it is known that medical management alone does not suffice.
5. Under proper medical and radiological management, surgical intervention is almost never an absolute necessity, except in the adenomatous cases.

DISCUSSION

DR. E. T. F. RICHARDS, St. Paul: As Dr. Kern has pointed out, our chief interest in the treatment of hyperthyroidism centers on exophthalmic goiter. Adenomata of the thyroid, if toxic and producing secondary hyperthyroidism, should be removed surgically. In adolescent goiter both surgery and x-rays are contraindicated. In exophthalmic goiter, however, we have somewhat of a range in our choice of treatment.

As an internist following cases of exophthalmic goiter over periods of years, I have been much impressed with the remissions and exacerbations that occur in the natural course of this disease. Remissions in exophthalmic goiter may occur spontaneously, as is well known. They may follow rest in bed. They may follow the administration of iodine, or x-ray therapy, or resection of portions of the thyroid gland. We must be on the alert, therefore, that we do not interpret a remission as a cure in this disease.

To speak of a cure in exophthalmic goiter we must have observations following any form of treatment over a period of years, as it is a well known fact that exacerbations of the disease may occur years after the original form of therapy. Exacerbations occur in waves in exophthalmic goiter, and each wave leaves a more seriously damaged myocardium in its wake. Our aim, therefore, in treatment must be to prevent all exacerbations, thereby effecting a permanent cure of the disease.

In the present state of our knowledge a subtotal thyroidectomy is the most effective and most rapid means of curing exophthalmic goiter. Partial thyroidectomy, which unfortunately is still a common operation, is frequently followed by relapses.

The x-ray will also effect a cure in exophthalmic goiter in selected cases, especially if the disease is seen early, where the myocardium is not already seriously damaged, where the element of time is no great factor, and where the degree of toxicity already established is not too extreme.

The first lantern slide shows a cure in exophthalmic goiter following x-ray treatment. With an initial basal metabolic rate of plus 85 we see a gradual return to normal, reduced finally to minus 7, over a period of eight months. During this eight months' period six x-ray treatments were administered. I speak of this as a cure because it dates back to April, 1923, and since December, 1923, which is now an interval of sixteen months, this patient has remained perfectly well. Subsequent observations show that she continues to maintain a normal basal metabolic rate and is in perfect health.

The next slide shows for comparison a cure effected by subtotal thyroidectomy. Note the more rapid decline in the basal metabolic rate in its drop from plus 90 to minus 6. Here again we may with reasonable safety speak of a "cure" as these observations date back to December, 1922.

The next slide well illustrates the importance of long continued observation before pronouncing a final cure in exophthalmic goiter. In this case thyroidectomy, followed by x-ray treatments, produced a symptomatic cure with a drop from plus 61 to plus 10 in the basal metabolic rate, but twenty-two months later a marked exacerbation of the disease with a sharp rise in the basal rate occurred. Note the prompt response obtained in this exacerbation on the administration of Lugol's solution.

The next slide shows the initial drop which is obtained almost uniformly in exophthalmic goiter under rest and Lugol's solution—in this instance from plus 90 to plus 53. This is the time of election for operation.

In the next case the basal metabolic rate remained practically stationary after operation. When followed up with x-ray treatments a drop to normal, as shown on the slide, occurred in the basal rate.

The last slide shows the initial drop and the best time to operate following rest and Lugol's solution with the basal metabolic rate declining.

In conclusion, it is evident that we have in both thyroidectomy and the x-ray powerful agents in the treatment of exophthalmic goiter, but whichever form of treatment is selected must be adequate and thorough, and we must

not speak of cures in this disease unless we have follow-up observations extending over periods of years.

DR. H. L. ULRICH, Minneapolis: I regret very much that Dr. Kern had to read his paper so hurriedly, because some of us in the back of the room didn't clearly hear all he said. However, I had the good fortune to read this paper before it was presented, so that I ought to be prepared to discuss his subject. His statement regarding surgery and x-ray as having practically identical results I cannot dispute or refute. I haven't enough experience in those two fields to make any statement. The disease itself, however, is a very fascinating one, and we have to think in the physiological and anatomical way in our approach in treatment of this disease.

The fundamental point that should be emphasized, of course, is iodine metabolism, and I have an impression that in the years to come, with this therapy that is going on at the present time in treating our water supplies and treating our juvenile population with iodine, the problem of adenoma of hyperthyroidism and toxic goiter will vanish. In other words, it is my impression that the prophylactic point of view is going to be very striking in the next ten or twenty years.

Then there is the physiological side to this disease, the unbalance of the vegetative anatomic system. I very much admired the work done some years ago in New York at Mount Sinai in which they took fifty cases of exophthalmic goiter and gave them what they called skillful neglect, skillfully neglectful treatment. Nothing was done with these patients except rest in bed, psychic support, and a little iodine; and their results are almost as striking as surgery, not as striking but almost as striking. Their fundamental principle in the approach on therapy is this fact that this is a self-limited disease, or possibly, as Dr. Richards pointed out, a disease with certain wavelike characteristics. Whatever our approach is we ought to remember that one point: That this is a disease which is self-limited, and it depends upon the type of the patient and the stage of the condition which approach we make in its therapy.

DR. M. J. KERN (closing): I wish to thank the gentlemen who have so thoroughly discussed this subject. In regard to the adenoma, there is no question but what the adenomatous type of goiter is a surgical condition. I did not wish to leave the impression that I favor the roentgenization of those goiters, although it is true that some very brilliant successes can be obtained in the radiation of toxic adenomata, especially those that have come up quickly.

In the matter of surgery versus x-ray in Basedow's disease—which was touched upon by Dr. Ulrich—I don't want to go into that, because I feel that either method is efficient and have no desire to belittle surgery. At the same time we must remember this: That radiation of the goiter must be done thoroughly. I remember some years ago when I was feeling my way with the ray in these exophthalmic goiters I knew positively that I did not give them enough ray. I didn't have short enough wave length at my disposal, and did not dare to put in enough filter, and I was afraid of the damage to skin and subcutaneous tissue with my light filtration. But with modern instrumentarium it is possible to put a real dose of x-ray into the thyroid, and it will do the business. Inefficient—that is, not enough—x-ray is nicely to be compared to the surgical method where a little piece or two of thyroid are taken out and not a real job done. On the other hand, the subtotal thyroidectomy has its radiological brother; the thorough and adequate dosage.

In regard to the remissions, there is no question. We have cases of hyperthyroidism that will get well for a while and then recur. But when you get one which really gets to "doing business," I have never seen such a case that would come back to normal without some treatment that was more active. When they get to sweating and have diarrhea and are talkative, etc., as the case I showed you here, rest, etc., alone will not suffice. You have to have either surgery or radiation. Many times you will find that a case that has been operated on has to be finished, as this one here, by radiation. On the other hand, I believe cases that have been radiated and have not come to a successful conclusion, later on should be finished by a surgical method.

The Iowa Agricultural Experiment Station at Ames, Iowa, has been doing extensive work in the administration of potassium iodide to livestock. Even though no fetal athyrosis or hairlessness of new-born pigs has been noted at the Station during the past fifteen years, nor any sign of iodine deficiency detected, it appears that the swine (*sus scrofa*) were in need of iodine, for additions of potassium iodide to the ration of young growing pigs in three different years increased their rate of growth some 10 per cent, as measured by live weight, and likewise increased their dimensional growth in height, length, and in leg circumference. The potassium iodide also increased the nutritive value of the feed nutrients ingested.

The work in potassium iodide feeding to swine has recently been compiled in bulletin form at the Iowa Station. The new bulletin contains a number of maps showing the relative distribution of simple goiter of man of the United States, prevalence of exophthalmic goiter in the United States and the iodine content of drinking water in various sections of the nation. Anyone interested in the work of the Iowa Station in these iodide feeding tests may secure a copy of the new iodine bulletin free by addressing the Bulletin Section, Ames, Iowa. The bulletin is known as research No. 86, "Studies in Iodine Feeding." It was written by John M. Evvard and C. C. Culbertson.

CARE AND TREATMENT OF THE PSYCHONEUROTIC*

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The psychopathic constitution is dependent on an ancestral history for all of its handicaps and mental and physical distortions; and, consequently, the patient must be conceded to be the victim of heredity. And heredity is perhaps most clearly described as "the organization of the germ and all that depends upon it." This is Conklin's version, and he is a biologist. The greatest difficulty, however, in studying these people is that the history of heredity is difficult to obtain. We can go back perhaps one or possibly two generations and learn something about the ancestors, but even then we do not get very close to the actual situation. But heredity may cover several generations or even three or four centuries before it comes out in the individual of the present or the past decade. There are so many variations, too, to the lines of heredity that it sometimes makes it very confusing, and those who do not believe in heredity would probably discard many of its theories.

It is rather singular that the laws of heredity have not been most carefully considered and understood; and yet they date back to 1813, when it was intimated that such a thing was probable. It was forcibly brought to the attention of the world by Gregor Mendel, Abbot of Bruënn, Austria, who published the result of his work, extending over several years, on plant hybridization, in 1866; but it was little considered and not definitely accepted until about the year 1900. Mendel's experiments were distinctly biological and were concerned with individual organisms and their characteristics. Since then there have been additions made to the Mendelian idea, but the fundamental impression that Mendel left has been greatly developed in the last twenty-four years. Why do so many people inherit certain diseases? Why are there so many candidates for syphilis, tuberculosis, and peculiar coloring of hair and eyes, variations in the shape of the nose and face, queer variations in either structure or characteristics or mental conditions? They all have their base in heredity, and the laws of heredity apply to the owners of physiological

as well as biological tendencies. Human beings cannot be controlled as Mendel controlled his plants; neither can they be managed or controlled after they have developed their peculiar characteristics. Their environment has little to do with their subsequent behavior or what is brought out in them later in life. We can readily conceive of a child who is born of tuberculous parents who may have inherited a tendency to tuberculosis; but if that child can be removed from its parents early in life, the susceptibility to tuberculosis will disappear. Not so in psychoneuroses. However, it seems to Weisman that he has established a theory of predestination, preformation, and dominance; that is to say, we are given what was decided for us many years ago, and there seems to be no escape from it except in very occasional instances.

The germ cell and its fertilization are the keynote of the beginning of a hereditary defect. That means that certain parental transmissions produce certain characteristics in their offspring, and it is all due to the fact that the germ cell is an immortal cell and remains and is transmitted true to form through any number of generations—this is contrast to the body cells, which vary, appear, and disappear; but it is not so with the germ cell. Consequently, if the psychoneurotics are what they were predestined to be, nothing can change their ends, and they go through life with this biological and hereditary menace in front of them.

It is rather strange how the dominating element of one parent will appear through three or four generations. For instance, a woman—the great-grandmother or grandmother—may develop certain defects in her mechanism; in her children appear similar or varied defects of the same type, like mental or nervous states that are abnormal, peculiarities, convulsions, or other defects. The daughter in turn transmits them to her son and daughter; they both have quirks in mind or body that are very manifest,—a daughter has convulsions and dies early in life from a paralysis; the son, carrying a crippled germ cell, marries a strong, healthy woman who would seem to be the dominating character of the pair, but, as a matter of fact, the dominant cell in the man persists, and his wife bears two children, both of whom are defective,—one is deaf and dumb and has convulsions, and the other has a defect in constitution, develops a spinal paralysis, and dies at an early age. Why should not the wife, who is the stronger of the two, domi-

*Read before the Minnesota State Medical Association, Minneapolis, April, 1925.

nate the situation instead of the husband? It is because he has inherited all the characteristics which are really dominant and destructive. The minor defects are much more in evidence, perhaps, than the gross defects; and so the psychopathic has his peculiarities, his limitations, and he goes about so far in life when he reaches the maximum of his capabilities, and is halted; he is sick, nervous, or disabled, and nature puts him in bed or puts him out of commission in time. Then, after a long period of inactivity or rest, he comes back, perhaps able to resume a part of his former occupation; but he has lost something in his transmission, and particularly when he has reached the climax of his possibilities. He, therefore, goes through life handicapped with fears and anxieties and weaknesses of various sorts, and he is unequal to the demands made upon him, whatever they may be. He is the sort of man who marries regardless of the laws of eugenics; and, if he is the dominant character, his issue is of the same type as he is himself. If the wife is the dominating factor, the child may be well and strong and equal to any emergency. One great difficulty is that these people do not know where their strength or weakness lies, whether in their hair or their brains, or whether they inherit them through well understood processes from some of their ancestors, and are likely to hand them on by the same processes to their descendants or not.

Nearly everyone believes in heredity or, in the popular phrase, that "blood will tell," both in plants and animals. They know that plant life is pretty well understood, and Mendel and Burbank have proved this to a certainty. The average man knows that in order to breed race horses he must have good stock to begin with. Some people believe that good children will be born from bad parents quite as often as from good parents, that health will come out of weakness, and that wisdom will be the fruit of the family tree of fools. A great many people believe that when children are born weak, unhealthy, short-lived, or foolish, education, moral teaching, medical science, and good environment will transform natural weakness into strength, folly into wisdom, and put brains into empty heads. Conklin remarks, incidentally, that people cannot inherit wooden legs, but they do inherit wooden heads. One must look inheritance squarely in the face.

Good education and good environment should be given every child that comes into the world, but we must remember that these things will never add good qualities to the child's natural inherited equipment. The point is that we do not all have an equal biological chance, for there are the wise, the prudent, and the strong, the foolish and the weak, and unless we improve the lazy, the shiftless, and the harebrained, we shall have to provide for them in some way, as they belong to the retrogressive race and are recessive, and they will drag civilization down. When we consider what is being done for all the defectives of various kinds and how well they are cared for, we can readily understand how difficult it is to do anything for the victim of heredity because he was born from the propagation of the original germ cells of his defective ancestors. Heredity, meaning "blood will tell," is a truism, but some wit has added "sometimes the less it tells the better." You all know, probably, of the Kallikak family. Martin Kallikak was a man who believed that blood would not tell, or, if it did tell, that it would not tell on him. Martin had a dramatic history, and the history of his blood and germ cells has been related in a little book called "The Kallikak Family," by Dr. Goddard. Martin Kallikak was a young soldier of the Revolutionary War. His ancestry was excellent. But one wild night up the Hudson River, Martin forgot his noble blood. In this night of dissipation he met a physically attractive, feeble-minded girl, and the result of this meeting was a feeble-minded boy, who, when he grew up, married one of his own ilk and produced numerous progeny with a large percentage of feeble-mindedness,—lazy, shiftless, thriftless, thieving people. Martin's foot slipped 150 years ago, and his relations with the feeble-minded girl have given the country 450 nation-destroying descendants, including 143 feeble-minded persons, 33 immoral, 36 illegitimate, 3 criminal, and 8 brothel-keeping individuals. Later in life Martin married a young Quaker woman of splendid talents and heroic ancestry, and from this union there were 496 direct descendants, all normal, that have included nation-builders,—governors, signers of the Declaration of Independence, soldiers, university founders, doctors, lawyers, judges, and educators. This is a most striking story of what good blood and sound heredity will do when present in both parents, and

what may happen when one side is feeble or defective.

Drawing a midline between these extreme cases, it is quite easy to assume that the majority of our psychopathic patients have an inherited streak which accounts for their various weaknesses and shortcomings. What are we to do with them? The wise doctor who sees this coming in early life and who knows the value of the parental blood and tendency will prepare for just such an emergency as commonly arises. He will see that these children are not overworked in any way,—in school, in labor, or in anything that would tend to bring on exhaustion of their enfeebled powers. These children should be carefully nourished, and be given plenty of time for rest and an out-of-door life. Education, as it is carried out at the present time, is not very good for the psychopathic individual. It is too burdensome, too intricate, and too misplaced; it is the education of the intellect rather than the education of the individual, and particularly should these psychopathic people be restricted from this present-day educational system. Of course, there are many handicaps in the way. The parents are very anxious for the child to have an education, and, quite as often, are quite anxious to have the child away from home so that their responsibilities may be lessened. Granted that the child gets through the first or even the second decade of life without any manifestations of disordered nervous system, when the time of stress and strain comes upon him we will find him ill-prepared for it, particularly between the ages of 20 and 30, when, according to our usual assumption, he is engaged in his life work. If he survives this period, he may be in fairly good condition until he reaches the age of 45 or 50, when another strain comes to him, and he then shows his inherent weakness.

One of the principal handicaps to the treatment and care of these people is the family or friends. The patient gets more free advice and information than is generally given at the average free dispensary. The physician, too, who is finally asked to consider the care of the individual, receives an abundance of misinformation and foolish advice after the family have acknowledged their defeat in the patient's care. There ought to be some law or, at least, some definite understanding in the profession relative to the care of the patient; that the patient should be put under the strictest supervi-

sion of the physician, and that he should be separated entirely from all this loquacious and supposedly sympathetic attachment. The physician should be permitted to train the individual into better habits of thinking and methods of living, teaching him regularity in his home life, as well as in his other active life. But this is Utopia. Very few people will graciously submit to rules and regulations. The result is that few psychopathic individuals are improved in their mentality,—their outlook upon life. The wise thing to do with the average psychopathic person is to change his environment; that is, to take him away from home, his family and friends, place him in an institution where he can be confined, controlled, and educated, and treated for whatever physical disease he may have. A few weeks of so-called loneliness may be transformed into a few weeks of bliss and contentment because the nagging of the family is not the prevailing issue. Many of these people make a fair recovery or at least are improved to a degree by their seclusion, isolation, and separation from all former entanglements.

One very important thing in the study of the psychopathic is the possible benefits by marriage. The chances, of course, are very great against the improvement of the race by the marriage of a psychopathic individual to a normal one having a good heredity because it is impossible to tell who will be the determining factor in the marriage. Granted that the strain is good on the family side, and that either of the persons about to be married has only acquired defects, the probabilities are that neither one will suffer nor will their descendants suffer. On the other hand, if the man has all the errors of his blood, they will crop out, and the probabilities are that something detrimental will happen to the offspring. With this there is a saving clause, however,—a man or woman who carries the skeletons of the family also carries a large host of virtues; so perhaps virtue may predominate over disease or defect, and thus a happy strain is brought about.

There has been a great deal of talk about cousins marrying, and both the church and the law have pondered over it and shuddered at it. Even in the 13th chapter of Leviticus there are thunderings of divine wrath upon "the man who shall approach unto any that is of near kin to him"; and yet cousins marry, near cousins as well as distant cousins, brothers and sisters, and fathers and

daughters marry,—and if the strain is good there is no probability of any outcropping of anything unfortunate. But if the strain is bad, there is the same likelihood as there is in the mating of other adverse and contradictory strains, with the same result. In ancient Egypt during the reign of the Ptolemies, who ruled over Egypt and gave it a polished and brilliant civilization for many centuries by the sheer intelligence and character of its members (this includes the ancestry of Cleopatra), there was the highest inbreeding in recorded history without ill results. The family furnished illustrious and able rulers for centuries. Many similar brother-and-sister, uncle-and-niece marriages took place among them from the first to the twelfth Ptolemy. The families of the present rulers of Siam have intermarried in a similar manner for 4,000 years except in the past two generations. The marriage of Charles Darwin with his cousin, Emma Wedgewood, grand-daughter of the founder of the great Wedgewood potteries, has resulted in four sons who have been ornaments to the history of England. Other famous intermarriages bear the same record of good results. It is said by Wiggam that dominant qualities under typical conditions do not ever skip a generation, but recessive qualities will skip one to four generations. On the other hand, intermarriages have wrecked some of the royal houses, particularly the Houses of Spain and Austria—after insanity had crept into the blood, probably through the grandmother of Charles V of Spain.

It hardly seems necessary to go into the symptoms of the psychoneuroses. They are usually of a mixed type, and they embrace almost any complaint that can be described by a patient. Hence these unfortunates are often looked upon with indifference and are treated accordingly. They should be as carefully investigated as any other sick person, for their complaints are very typical and just as discomforting to them as those of a patient suffering from any other disorder. They are easily fatigued and exhausted mentally, and that means that the fatigue and exhaustion are transmitted to their physical apparatus. Naturally everything that is contained within them becomes irritable and disturbed, and they are classified under the common names of neurasthenia and psychasthenia because these are easy terms to use, and, as they cover a multitude of the sins of omis-

sion on the part of the doctor, they are convenient terms.

You will find that most of these people complain of headaches and uncertainty; they are supersensitive, have vague pains, and are more or less sleepless, and they are probably emaciated or at least their somatic functions are so disordered that their chemistry is entirely changed. The first thing these people need is protection. That means that they must be given an opportunity to recuperate, to restore the activity and vitality of their tissues, which requires proper feeding. It does not necessarily mean that they must be overfed or over-fattened, as with the old form of rest cure. It is much better for them to gain in weight slowly, or even to hold their weight rather than to increase the amount of substance. The eliminating functions of the various organs of the body should be carefully attended to. The kidneys should be assisted in their functions by the proper administrations of water, the use of baths. The intestinal tract must be looked after by the usual careful methods of feeding and a general clearing-out process by enemas and sometimes laxatives of a simple sort. Above all, we try to improve their mental and emotional habits, first explaining to them that they can tell their story once and for all, explain away their fears and combat their obsessions; and teach them to use self-control. Under the circumstances rest is the one and imperative thing for them to go through and this period of rest varies according to the individual. A man or woman who has been in a disordered state of mind and body cannot rest in a few weeks. Such patients must have a long enough period so that they can really make some start toward restoration. During all this time much of their digestive disturbances can be overcome; their constipation disappears because they are properly fed, and properly cleaned out. Their muscular activity improves under rest rather than under forced exercise, in an exhausted individual. Their appetite is a matter of no special concern. They are simply told to eat, ordered to eat, and are fed, if necessary, without regard to whether they want food or not. They must be trained to sleep, even at the expense of giving them some of the milder soporifics. There is much said about the harm that drugs do, but when patients are in a hospital and properly managed it is very easy to remove the drug

when advisable, and eliminate the habit. If one can keep them long enough, rest them long enough, and separate them from their families long enough and eliminate the curious and so-called sympathetic friends, these people get so much better they are astonished at themselves. They get a better hold on life, they have learned during their course of rest and training that there is something worth while trying for. The ordinary, common, everyday assurance on the part of the doctor who does nothing else, furnishes little relief for these unfortunates. To make them better one must do something for them and make them understand why it is being done.

DISCUSSION

DR. FREDERICK MOERSCH, Rochester: I believe if Dr. Jones had held us to his word we would have all left the room when he said that if there were psychoneurotics here they should go out. I believe that in an audience of fifty men there are probably forty-five with some psychoneurotic taint. If a man is 100 per cent square with the world it should not be hard for him to become president, or to get along as W. A. Jones. But we are not all 100 per cent, and probably the reason for that is that the environment does play a part. Undoubtedly heredity is the great factor. In the last thirty or forty years we have all recognized that eugenics is probably the keystone for the entire psychoneurotic problem.

As Dr. Jones said, if a patient wants to go let him go. It is almost hopeless to struggle along with a patient who has not the material in him to fight with. If the personality of the patient can be analyzed, some definite adjustment may be reached, but only too often after the patient gets back into the home the same financial and social difficulties arise, and the patient slips back into the old way.

The greatest expense of the state of Illinois is its public schools, which runs up into the millions. Its second largest expense is the care of the insane, the feeble-minded and the criminal. That is really something to think about. Each year those expenses are becoming greater and greater, and all the time not only the laity but scientific persons get the idea that education is going to correct this. As Dr. Jones has said, brains cannot be made with education. There must be some fundamental change because it is these rather poor individuals with a poor makeup that propagate by the tens, where the more highly cultured and probably better qualified individuals have no offspring, or only one or two. I believe that the solution of the problem will come from the standpoint of heredity, and not in the treatment of the existing condition.

DR. E. L. TUOHY, Duluth: I was among those that were about to leave the room also and refused to be called psychoneurotic. I come up here chiefly to pay tribute to the essayist, whom I greatly admire. Taking him at his word—and it certainly is important that we all study ourselves and that we induce our patients to do likewise—his strength is in his brain and not in his hair.

The medical profession is accused on all sides of being

interested only in the objective. The 75 per cent of folks who are profoundly unhappy and possibly sick have a host of troubles that are based on just what he is talking about, and we must give these callers conscientious attention. Heredity considered or not, the die is cast. Heredity is that feature influencing present day life comparable with those great forces of nature that have brought the world to what it is. There are said to be stars of such magnitude and such distance from the earth that even though light travels 180,000 miles a second, the light that is hitting the earth and is only picked up by the highest powered telescopes now, left its source when King Tut was being put in his tomb.

Most of us think altogether too finitely to grasp this amazing problem of heredity, and so, logical as eugenics may be, it seems almost hopeless. Therefore we have to do something to keep a lot of poorly equipped humans straight. Education alone can not do it by any means. The conventions can't do it. The church can't do it all by itself. The family life is perhaps the most important factor of all, and yet family life in this country is sorely threatened. The Literary Digest of about a month ago stated that there was one divorce for every three marriages in Oregon. The condition for the country as a whole is, I think, something over seven marriages for each divorce, whereas in Canada there is only one divorce for every 119 marriages. What is happening to our family unit? In a yearly change of cars many of our citizens must be including their consort.

Now, one thing to show the perversity of fate. There is a famous fresco in the Vatican at Rome by Michael Angelo. He painted heaven up here on the left hand side and hell down on the right side. An archbishop came in and criticized his work, stating that the women figures (those angels) were altogether too nude. So, in return for his criticism, Angelo painted the archbishop down in hell. The archbishop came along and demurred, saying to the Pope, "Why does he put me down there? Have him take me out at once." And the Pope said, "I have no power down in hell. I can't take you out." So the Bishop whose name would long ago have been lost in time's turmoil has been immortalized.

And so on that basis—this famous Kallikak, I will ask you: Is he more famous on account of his foot slipping on the Hudson or on account of his association with the Quaker?

DR. FRANK BILLINGS, Chicago: I am interested because I have had some experience in this subject. I was chairman of the Board of Charities in Illinois from 1906 to 1912, inclusive. I had opportunities to study the subject of insanity and of feeble-mindedness as they prevailed in our own state and became so interested that our Board made investigations elsewhere. In 1908 we had 12,000 insane dependents in hospitals in Illinois. We had 1,300 feeble-minded at our school at the Lincoln School for Feeble-minded. We had over 10,000 epileptics in the state, some of whom were in institutions, either insane or feeble-minded, but the larger number were outside. New York had the largest number of insane and feeble-minded; Pennsylvania, Massachusetts, Ohio, Illinois running along together.

In the eight years that I was in this work we found that in Illinois there was a net annual increase of three per

cent of these people; practically the same in New York, Pennsylvania, Massachusetts, Ohio. Those are the most densely populated states. Now figure that out: 12,000 in hospitals in 1908, a net increase of 3 per cent, see how many more patients you have year by year. In 1908 the appropriations made by the legislature for the care of the insane and feeble-minded, orphans, delinquents—some of them in St. Charles school for boys or Geneva school for girls—was eight million dollars for the biennium, the legislature meeting every two years. Two years ago when the last legislature before the present one met, the appropriation for the same people in Illinois was 30 million dollars, an increase of 22 million dollars in seventeen years. That increase in the appropriation was not due altogether to the increased number; they received better care than formerly.

Now that is true all over the country and doubtless true in Minnesota. Unless something is done to prevent the procreation of this class of people it will continue. Even though you segregate them and take care of them all they are not happy. The increase in our taxes is going on year after year. If the same increase goes on in Illinois in the next seventeen years it will cost sixty million dollars to take care of this class of people annually in Illinois.

Thinking about the matter, our Board thought first of the segregation of a larger number of them even though it costs money. So Illinois today has a colony for epileptics, two institutions for the care of the feeble-minded children of the state, hospitals for the insane housing over twenty thousand, besides those that are in private institutions. Well, that's made better care but it hasn't checked the annual increase.

Just at that time, 1908 and along there, Ohio had passed a bill, and I think Oregon or one of the northwestern states had also passed a bill to sexually sterilize both male and female delinquents and criminals. You know about how the sterilization was done: vasectomy in the male and salpingectomy in the female, not interfering at all with sexual function but if properly done preventing conception. The bill was prepared and in the preamble I had written into it the famous Juke family, whose numerous descendants were all delinquent, criminal, feeble-minded and what not; and the Jonathan Edwards family, about the same number, everyone of them normal. It went to the committee and there were hearings held. When we talked about this protection of the public and that it didn't interfere with the pleasure or function of the individual, many women and men present nodded their heads and approved, but religious sects in Illinois prevented its passing.

I think Dr. Jones' paper is a splendid consideration of the subject,

DR. ARTHUR SWEENEY, St. Paul: I don't know what Dr. Jones said in his paper but I am going to agree with him because I have known him sometimes to be right, and I know that in this matter he is founded upon sound teaching, in that he is a disciple of Wiggam, whom I regard as an apostle of sound doctrine. I don't know what he said but I know something about the fact that something must be done—if we are going to build up a good citizenship in this country, if we are going to build up sound minds and sound bodies—to exercise the same care in the breeding of men that we do in hogs. We recognize the economic value of a good hog or a good bull or a good cow. It produces

money, and has results, tangible and concrete, that don't need any abstractions in their interpretation. But with human beings we are medieval, archaic in our system of treatment. We must face this fact.

Under the law a dead man cannot dispose of property. A will is not a right; it is a privilege awarded by the state that a man may before his death dispose of his property. In other words, it is a permission given by the state and not a naturally inherent right. What should be the attitude of our lawmakers and of people generally in regard to the right of procreation? Is there a right, an inherent right, outside religion, to justify the propagation of the unfit? Where can you find it right for a man to reproduce his kind to the detriment of society? So long as society exists we must recognize our duty to that society. I have no right to go out and steal. I have no right to go out and burn and destroy and violate the laws. But I have the right to reproduce. Any person can do it. Is it a right? Is it in consonance with the laws and regulations of society, and with the proper development of our social instinct that any fool can go out and get married and bring other fools into the world? Where is the right? We only find it in that religious doctrine which says, "Crescite et multiplicamini," "Increase and multiply," a religious formula that is founded upon superstition and lack of scientific regard for the consequences, lack of care for the effects on society, and lack of foresight for our own welfare.

We talk about eugenics in a very nice way. Let us segregate the unfit! If our army tests have taught us anything they have taught us that 42 per cent of the people in the United States are under thirteen years of mental age. They represent 7 per cent of the feeble-minded; 15 per cent of the moron type under eleven years of mental age; and 20 per cent of the dull normal who work with the pick and shovel, who can reach only the fourth grade in school, can never become properly literate, can never read the Constitution nor the things that go on in the world, and can never reason from abstract principles but only from the concrete things that their hands can feel and their eyes can see. What rights have they against that superior 15 per cent who are the educated, good citizens, captains of industry, the high-minded, superior, intellectual type of our country? What rights have they to set their votes against the higher opinion of the more intelligent type? We have got to face these facts, gentlemen.

How are we going to segregate the people of Minnesota, for instance, according to their right to procreate except by dividing the state in half and putting the incompetents and unfit in one-half and setting the rest of the people on the line to guard them for fear they might accidentally come into sexual contact? It would keep us pretty busy. That's the trouble with eugenics: It doesn't work in practice. It would be very nice indeed if we could do those things, but what's the use of our talking about that sort of thing?

Very much more to the purpose would be stimulation of the increase of the superior type by bonus. If a man has two children let him have a certain proportion of exemption from taxes. If he has three or four or five or six let his exemption be greater. Put a bonus upon the development of the fit rather than a penalty upon the unfortunate unfit who can't understand and would rebel against

what they considered to be interference with an inherent right. But even that plan won't work, because who is to draw the line?

We have got to approach this matter in a practical way. Eugenics is all right in theory but it won't work in practice because we haven't educated the people. We haven't yet arrived far enough in psychological investigation of who are the right people to procreate. One of the most superior intellects that I found in Camp Dodge was a negro who had never been to school, couldn't write his name, didn't know about anything except the hind end of a mule, and yet he was an intelligent individual.

I only want to conclude by emphasizing one thing: We have got to educate the people. This kind of talk is all right in a medical society but we don't need to be convinced. You gentlemen owe a duty to the people among whom you dwell to educate them against the idea that procreation is a right. It is a privilege that should be granted only to those who can produce good citizens.

ZINC STEARATE DUSTING POWDERS FOR INFANTS

The second report of the Committee on Accidents from Zinc Stearate Dusting Powders appointed by the Board of Trustees of the American Medical Association has recently been published.

There were reported to the Committee 131 accidents from the inspiration of zinc stearate dusting powders by infants. Twenty-eight of the victims died. The Committee conferred with representatives of certain distributors concerning the dangers incident to the use of such powders on infants. Following a meeting held at the headquarters of the American Medical Association, these distributors agreed to co-operate by adopting self-closing containers for the powders they distribute and agreed that cautionary labels are desirable. Opinions were secured from thirty-four representative pediatricians concerning the therapeutic value of zinc stearate dusting powders. Thirty-one believe that such powders have no advantage over other dusting powders, that they constitute a hazard to infant life, and that their use should be discouraged.

Heliotherapy.—Generations of laymen as well as physicians have somehow assumed that part of the beneficial effects of outdoor life is attributable to sunshine. The influence of sunlight on health and disease is being unravelled gradually. An impetus to the study has been derived from the investigations of the biologic actions of light, particularly as they are related to dietary deficiencies. It is now clearly established that exposure to ultraviolet radiations will protect against the effects of the lack of antirachitic factors in the diet. Furthermore, foods may acquire antirachitic properties by being irradiated. Recent experiments on the effect of radiation on the bactericidal power of the blood indicate that the exposure of the skin of animals to a source of ultraviolet radiation gives an increased bactericidal power to the blood and serum. It has been found that irradiation for purposes of treatment must be carefully graded, since excessive exposures cause a deterioration of the blood no less striking than the improvement obtained with smaller doses. (Jour. A. M. A., May 16, 1925, p. 1498.)

CAUSES OF SOME SURGICAL FAILURES IN GALLBLADDER DISEASE*

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Occasionally, we have patients return to us after apparently perfect operations for disease of the gallbladder and ducts with either a continuation or a recurrence of the symptoms for which the operation was performed. It is often very disagreeable to try to explain to them the reason for these symptoms, especially when they have existed for a considerable period or have recurred some time after the operation has been performed. These cases should not be put off with a few words and a prescription, but their symptoms should be even more carefully analyzed to ascertain definitely, if possible, the cause of their trouble.

This paper presupposes that the operation was carefully and properly performed; that there had been a careful exploration and that no organic lesions of the stomach or duodenum were present, and that the appendix, if diseased, had been removed.

If we assume that a gallbladder infection is usually secondary to some other focus, we should always carefully inspect the nose, mouth and throat for any evidence of disease. If there is any present, it should be immediately eradicated, and one may be surprised to see how some of these hang-over symptoms will disappear.

Constipation should always be corrected by diet or mild laxatives. Saline cathartics, such as the Carlsbad salts, taken in small doses before breakfast, will frequently prove very beneficial from their cholagogic action.

We should further remember that an old luetic infection, which apparently has been very obscure, may complicate any other organic trouble. Posterior root pains have been often mistaken for organic abdominal disease. Reliance should not be made on the blood Wassermann, but the spinal fluid should be examined in all suspicious cases. The question then arises how to determine the suspicious cases. We must remember also that a positive Wassermann does not mean that the patient may not also have gallstones. However, when a patient returns with some indefinite symptoms fol-

*Read at the Ramsey County Medical Society, May 25, 1925.

lowing operation, we should review our operative findings and see if the pathology present at that time was sufficient to account for the patient's discomfort. If we have had a negative blood Wassermann previous to operation, it would be advisable to have the spinal fluid examined.

Those complaining of pains form quite a large percentage of the postoperative returns. The type and exact area of the pain should be very carefully noted. A painful scar which gives discomfort when it is stretched or is tender to pressure usually yields to hot applications and massage or diathermy. When the pain runs along the border of the ribs towards the back, it is frequently due to a traumatic neuritis or myositis possibly caused by too vigorous pulling on the retractor, which pulls the ribs outwards. At times the retractor may slip part ways out of the deep wounds and dig into the soft tissues. A reflex diaphragmatic irritation may also be caused in a similar manner. Local heat and immobilizing the lower part of the chest with adhesive tape will cause these symptoms to disappear.

Pain occurring deeper in the abdomen and perhaps referred to the back may be the result of adhesions about the ducts, or to an actual impinging, angulation or constriction of the common duct. If the latter be the case, a slight tinge of jaundice may occasionally be present. Pain in this complication may become more severe than in the other conditions—perhaps more severe than in any, except where a stone has been left in the common duct. This pain may be directly under the scar, or in the epigastrium, and again, it may radiate around under the costal border to the back. Where a partial obstruction of the duct occurs, there is, in addition, a sense of fullness in the epigastrium and tenderness along the costal margin, jaundice of varying degree being usually present. These patients usually require additional surgery before relief is obtained.

Abdominal tenderness is often present for a time following operation and, as a rule, receives little attention. However, in patients with a hypersensitive abdomen it is often a very difficult symptom to relieve. It may be due to a pinching of the small nerve filaments in the scar tissue, or to an overproduction of scar tissue as in a keloid. If it be a scar of keloid tendency, x-ray or radium will do much to relieve the patient. If, however,

it is due to a pinching of these nerve filaments, heat and massage seems to give the best results. At times it may be necessary to inject alcohol about the wound.

Very frequently, the only symptoms remaining after surgery of the gallbladder and ducts are referable to the stomach. Bloating and belching after meals may be due to either a hypoacidity or hyperacidity, plus pylorospasm. Cases presenting these symptoms should always have a test meal to determine the degree of gastric acidity. Frequently, cases with hypoacidity have severe cramp-like pains in the epigastrium almost resembling a gallstone colic. The pain may even radiate to the back and frequently runs around the costal margin. Looseness of the bowels may, at times, be a symptom. Physical examination does not reveal very much even at the time of pain. These symptoms readily disappear when liberal doses of dilute hydrochloric acid are given. Persistent hyperacidity should be relieved by alkalis, and, where pylorospasm is present, some antispasmodic is indicated. Pylorospasm is usually diagnosed by the x-ray, but care should be exercised to rule out an obstructed pylorus due to postoperative adhesions. Re-raying these patients after having given them atropine will clearly differentiate between a spasm and an organic obstruction. The symptoms of obstruction due to adhesions will vary in severity depending upon the degree of the obstruction present. Where it is marked, relief can hardly be obtained without reopening the abdomen, and, if possible, freeing the adhesions and interposing omentum. In some instances, however, it will be necessary to do a gastro-enterostomy.

Adhesions, as previously stated, may also cause kinking or partial obstruction to the common duct, producing symptoms which resemble postoperative stricture of the duct, and probably can be told only at operation.

Jaundice beginning or recurring some time after the operation may be due to a (1) reformation of a stone in the duct, (2) stricture or angulation of the duct due to adhesions, (3) carcinoma of the duct, (4) change in the head of the pancreas either benign or malignant. Stones are usually the easiest to diagnose, as they may present the symptoms of pain, chill, fever, nausea, vomiting, and later, jaundice. Frequently the stone works down to the ampulla, where the ball valve action takes

place. Stricture or angulation of the ducts causes slight jaundice, which is more or less constant and accompanied by pain along the costal margin or into the shoulder, and tenderness along the liver edge. Carcinoma of the common duct is usually first noticed by jaundice, which develops gradually and is permanent, never intermittent, and becomes very marked. Pain may be dull or aching in character and felt along the costal border or epigastrium. Inflammatory or malignant disease in the head of the pancreas may cause jaundice, which is often hard to differentiate from cancer of the duct itself, except when the abdomen is opened. However, in pancreatic involvement there may be metabolic disturbances which help in the diagnosis.

Another condition which recently came to my attention was a case of hemolytic jaundice which had been operated elsewhere for gallstones four years previous. She improved for a time and then slight jaundice and epigastric distress and occasional stomach upsets began to occur. When I examined her she was in a crisis and the spleen was easily palpable a hand's breadth below the costal margin. This receded somewhat as her symptoms improved. I later did a splenectomy and, to date, she has been entirely relieved. While this condition is rare when considered with others that cause a persistence or recurrence of symptoms, nevertheless, it should be borne in mind.

In women, epigastric distress, gas, etc., may be caused reflexly by pelvic conditions such as a large cystic ovary densely adherent to the cul-de-sac, or an adherent retroflexion. I have seen both of these conditions cause the above symptoms

which disappeared when the pathology was corrected.

In one of Deaver's recent clinics he states that the common cause for the persistence or recurrence of symptoms is prolonged pathology. In other words, he says, "failure to make an early diagnosis, or having made the diagnosis, procrastination in advising surgical relief. The internist occasionally tells us much of his clinical material is made up of patients suffering from recurrence of symptoms following operation for gallstone disease or ulcer. The answer is: So many of the patients for whom either of these operations have been made were long sufferers before operations; in other words, the diagnosis was not made early enough for early operation. Late operation, better, of course, than no operation at all, reveals late pathology—pathology which is no longer confined to the point of the original focus, but extended well beyond this point, involving adjacent structures, in the shape of chronic pancreatitis following medically treated gallbladder disease."

Pancreatitis very commonly follows chronic cholecystitis and is apt to clear up only very slowly after cholecystectomy, tending to keep up the symptoms for which the patient was operated. In a like manner, hepatitis may also keep up the symptoms for a time, as it has been shown that there is a free communication between lymphatics of the liver and those of the gallbladder—infection passing from either one to the other. It may readily be seen that symptoms of distress and indigestion may persist until all evidence of infection in the pancreas and liver have disappeared, which, under certain circumstances, may be a long time.

EFFECTS OF VACCINATION AT UNIVERSITY OF CALIFORNIA

There has been no case of smallpox among the student body of the University of California at Berkeley since 1907, when the regents adopted the rule that all entrants must possess satisfactory evidence of immunity to smallpox before they can be admitted. In the State of California for the year ending Dec. 31, 1924, there were reported 9,424 cases of smallpox. As this makes a case rate of 2.41 per thousand population, our pro rata expectation of smallpox cases among the student population, calculated on 10,000 individuals, would be twenty-four cases for that year—if vaccination were not enforced. There were three cases of smallpox among unvaccinated employes, two of whom were janitors, and one was a stenographer. Students who came in contact with these individuals and with others during an epidemic, in our city in 1913, when five afflicted persons out of thirteen cases died, were absolutely protected. It is

therefore needless to offer any arguments save the one, that compulsory vaccination should be required of all entrants on matriculation.—Legge, R. T., *Pub. Health Rep.* 40:1037 (May 22), 1925.

SMALLPOX TAKES HIGH AND UNNECESSARY TOLL

Fifty thousand persons in the United States last year had smallpox unnecessarily. More than 800 of that number died needlessly. They had not been vaccinated.

No one need have any fear of being vaccinated, says *Hygeia*, popular health magazine published by the American Medical Association, in its September editorial pages. Among the millions of persons in the world who have been vaccinated against smallpox, accidents have occurred to only a few. Many more fatal accidents have resulted from a closely trimmed fingernail or corn.

Hygeia recommends that a person be revaccinated every five or seven years to make protection against the disease absolute.

CAUSES OF DEATH IN THE FETUS AND NEWBORN: BASED ON 450 NECROPSIES*

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Before taking up the consideration of our series of autopsies on stillborn fetuses and newborn infants, a few facts relative to the situation in Minneapolis will be presented as a basis for more intelligent consideration of the facts gleaned from our autopsy material.

During the years 1914 to 1924, inclusive, there was a total of nearly 98,000 living births, of which over 50,000 or 51 per cent were delivered in the hospital, and about 48,000 or 49 per cent in the home. Of these deliveries approximately 36,000 or 36 per cent were done by physicians in the home, making a total of over 87 per cent delivered by physicians. During this period about 12,000 or 12 per cent of the deliveries were done by midwives. The percentage of hospital deliveries has increased during this period of time from 25 per cent in 1914 to 70 per cent in 1924. The percentage of home deliveries has decreased from 75 per cent to 30 per cent. The percentage of deliveries by midwives has decreased during this same period of time from 20 to 6 per cent.

During these same years there was a total of about 3,700 stillbirths with an average percentage to living births of 3.7, which percentage has remained practically stationary during this entire period of years. In this time over 2,200 or 60 per cent of the stillbirths occurred in the hospitals of the city. The percentage of stillbirths occurring in the hospitals has increased from 35 to 75 per cent. The increased gain was at a somewhat lesser rate than that of the total deliveries taking place in hospitals during this period of time. The average percentage for hospitals is somewhat higher than for the city at large, being 4.4 per cent of the living births.

During this time approximately 1,400 stillbirths occurred in the homes, an average percentage of 2.9. The percentage decrease of stillbirths in the home has not been so great as the percentage decrease of total deliveries in the home. These fig-

ures indicate that while the actual number of stillbirths taking place in the hospitals has shown an enormous increase, there has been an actual percentage decrease.

The same facts hold true in regard to the neonatal deaths, except that the percentage decrease has been even more marked. There have been 1,850 neonatal deaths in the hospitals, this being 54 per cent of the total number. Something over 1,500 neonatal deaths occurred in the home, an average percentage of 45. This shows a relative decrease in the hospital even more marked than that taking place for stillbirths. If one considers the actual number of stillbirths taking place during this period of time one finds an actual increase in numbers but no increase in the rate. There is a slight percentage decrease, dropping from a rate of 39 per thousand living births in 1914 to a rate of 35 in 1924, with an average rate of 36. During this same time the neonatal rate has decreased from 36 in 1914 to 29 in 1924, with an average rate of 34

Table 1
Total living births - Minneapolis

Year	Total	Hospital		Home							
		Number	Living Births %	Number	Living Births %	Physician		Midwife		Other	
						Number	Living Births %	Number	Living Births %	Number	Living Births %
1914	7932	1977	25	5955	75	4264	64	1630	20	71	0.8
1915	8536	2481	30	6055	70	4281	60	1710	28	64	0.7
1916	8802	3139	36	5664	64	4056	46	1613	17	95	1.0
1917	8685	3661	41	5124	59	3717	43	1332	16	85	0.9
1918	8718	4266	49	4453	51	3337	38	1066	12	61	0.6
1919	8142	4180	51	3962	49	2996	37	932	11	34	0.4
1920	9200	5635	60	3565	40	2819	31	819	9	27	0.2
1921	9099	5628	62	3471	38	2696	30	752	8	23	0.2
1922	9210	5929	64	3281	36	2640	28	696	7	45	0.4
1923	9713	6637	67	3176	33	2492	26	634	6	50	0.5
1924	9761	6829	70	2932	30	2358	24	537	6	27	0.3
Total	97789	50041	51	47748	49	35646	36	11620	12	682	0.6

per thousand living births. This decrease is not striking, but shows some improvement.

It is interesting to compare the decrease in stillbirth and neonatal death rates with those of later infant deaths and total infant deaths during this same period of time. By later infant deaths we mean those which occurred after the first two weeks of infant life. The rate in 1914 was 47 and in 1923 it was 22, with an average rate of 32. This shows the rate reduced by 50 per cent during the ten-year period. The total number of later infant deaths during this period was over 2,800. The total infant deaths during this period of time were over 6,000, the rate dropping from 82 in 1914 to

*Read before the Minnesota State Medical Association, Minneapolis, April, 1925.

54 in 1923, with an average rate of 68: If we combine the stillborn and neonatal death rates during this period we find a total of over 6,400, which exceeds by 400 the infant deaths during the first year of life, and by 3,600 the later infant

Table 2.

Total Births, Living Births, Stillbirths,
and Neonatal Deaths in Minneapolis

Year	Total births		Living births		Stillbirths		Neonatal deaths	
	Number	%	Number	%	Number	Rate	Number	Rate
1914	8243	100	7932	96	311	39	264	35
1915	8852	100	8535	96	316	35	294	34
1916	9166	100	8803	96	363	40	364	41
1917	8998	100	8685	97	313	35	332	38
1918	9047	100	8718	96	329	36	300	34
1919	8450	100	8142	96	308	35	270	35
1920	9524	100	9200	96	324	34	340	37
1921	9445	100	9099	96	345	35	314	35
1922	9551	100	9210	96	341	36	291	32
1923	10085	100	9713	96	372	37	310	32
1924	10105	100	9751	96	355	35	290	29
Total	101457	100	97789	96+	3678	35	3389	34

deaths. The decrease in the combined rate during this ten-year period has been negligible, dropping from 75 to 70, with an average rate of 73. These figures indicate clearly the necessity for a better understanding of the causes of death in this particular group of cases. It also points out very definitely where the large saving of infant life can be accomplished, if any such accomplishment is possible.

That no very strenuous effort has been made during the last decade or more to find out the causes of these deaths may be illustrated by the record of autopsies on stillborn and newborn infants as gleaned from the Health Department. In 1914 there was a total of 13 autopsies in a total of approximately 600 fetal and newborn deaths. This shows only a slight increase until 1923, when we undertook this work. During 1923, by efforts directed toward securing more of this material, we performed about 179 autopsies. In 1924 we secured a total of 183. Up to date, during something over two years of effort, we have secured autopsies on 450 fetuses and newborn infants. This work has been carried on under the auspices of the Children's Bureau, Department of Labor, Washington, D. C., and the departments of Pathology and Obstetrics at the University of Minnesota.

We have for analysis the autopsies on 450 cases of fetuses and newborn infants. Before taking up this analysis a few definitions and explanations may be in order. This autopsy material has been divided into two main groups: first, the group of stillbirths or fetal deaths; and, second, the group of newborn or neonatal deaths. By the stillbirth or fetal death we understand any death prior to birth or that of a fetus born with the heart beating, but without the establishment of respiration. We have restricted the use of neonatal death to those fatalities occurring in the first fourteen days of infant life. This definition is somewhat more restricted than the original one of Ballantyne, who covered the first month of postnatal life with the term neonatal period.

We have also divided our material into the pre-viable and viable groups. In the pre-viable group we have included all fetuses dying before or shortly after birth, which had not reached a sufficient stage of gestation to insure existence. This was based on a menstrual age of twenty-four weeks and a crown heel length of 34 cm. In the viable group we included all fetuses and newborn infants which were born after this period or had attained a body length in excess of this measurement. They were placed in this viable group irrespective of the fact that they might be dead-born or alive at the time of birth.

Table 3

Stillbirths - Minneapolis

Year	Total	% of Total deliveries	% of living births	Hospital				Home				Not stated
				Number	% of still-births	% of Total deliveries in hospital	% of living births in hospital	Number	% of Total stillbirths	% of Total deliveries in home	% of living births in home	
1914	311	3.7	3.9	108	36	5.1	6.4	193	62	3.1	3.2	10
1915	316	3.5	3.7	151	48	6.7	6.0	162	51	2.6	2.6	3
1916	353	3.9	4.1	167	46	6.0	5.3	195	54	3.3	3.4	1
1917	313	3.4	3.6	176	56	4.7	4.9	136	43	2.5	2.6	1
1918	329	3.6	3.7	196	60	4.4	4.6	127	39	2.7	2.8	6
1919	308	3.6	3.7	194	63	4.4	4.6	108	36	2.6	2.7	6
1920	324	3.4	3.6	211	65	3.6	3.8	107	33	2.8	2.9	6
1921	346	3.5	3.8	238	69	4.0	4.2	104	30	2.9	2.9	4
1922	341	3.5	3.7	248	73	4.0	4.1	87	26	2.5	2.5	5
1923	372	3.6	3.8	269	72	3.9	4.1	98	26	2.9	3.0	6
1924	355	3.5	3.6	266	76	3.7	3.8	84	24	2.7	2.8	6
Total	3678	3.6	3.7	2223	60	4.2	4.4	1401	38	2.8	2.9	54

Our stillbirths or fetal deaths have been divided into three groups: first, the antenatal or antepar-

tum group, which includes all those fetuses which died prior to the onset of labor. The time of death was determined by the best available clinical or pathological evidence. The second group we call the intranatal or intrapartum, which group includes all fetuses dying during the process of labor. The third group, postpartum or postnatal, includes those infants in whom death could not actually be said to have occurred until the cessation of the heart-beat. This subdivision includes, then, a group of fetuses which were live-born with the heart beating, but in whom no respiration was established.

The neonatal group has been subdivided according to the day of death. These groups are also subdivided according to fetal and maternal causes of death, so far as these causes could be determined by clinical evidence and autopsy findings.

We will now proceed to analyze the different groups as enumerated above. In our entire series of 450 autopsies, thirty-nine cases or about 9 per cent fall in the pre-viable group. Of these, nineteen or 49 per cent died antepartum deaths. Toxemia of pregnancy was the maternal cause in three cases. Syphilis was demonstrated in one instance. The remaining fifteen cases succumbed to a variety and in many instances unknown or apparently insufficient causes, such as maternal injury from a fall, placental infarcts, habitual abortions, missed abortion, and premature separation of the placenta. There were only three or 8 per cent of these cases in the intrapartum group of stillbirths. In one of these there was a premature rupture of the membranes with a prolapsed cord, followed by manual dilatation of the cervix, version and extraction. Causes are unknown in the other two instances. In the postpartum group we found eleven cases or 28 per cent. In this group a variety of causes contributed to the fetal death. There were two deaths in a multiple pregnancy associated with pyelitis, one anencephalic monster, placenta previa in one, and cause undetermined in six. Among the neonatal deaths there were six in the pre-viable group. These cases are not included among the viable neonatal infants. The causes operating to produce death in these cases were toxemia one, placenta previa one, birth trauma one, premature separation of the placenta one, fetal peritonitis one, and cause undetermined one. The main factors in the production of these deaths are the premature termination of labor and intra-

uterine fetal death prior to the period of viability. Almost one-half of these cases died intrauterine antenatal deaths prior to the period of viability. This represents about 4 per cent of the entire series. Toxemia is much more of a factor in the production of these deaths than is syphilis. Placental and cord causes, as well as accidental causes, make up a considerable percentage in this group.

The viable group is, for purposes of analysis, divided into the antepartum, intrapartum, postpartum, and neonatal groups; each of these being subdivided into premature and term infants. The neonatal group is subdivided into first-day deaths and later deaths.

Table 4

Stillbirths and Neonatal Deaths in Minneapolis Hospitals and Homes.

Year	Total Deliveries				Stillbirths				Neonatal Deaths			
	Hospital	%	Home	%	Hospital	%	Home	%	Hospital	%	Home	%
1914	2085	25	6148	75	108	24	193	63	10	32	193	68
1915	2632	29	6217	70	151	48	162	61	3	127	43	167
1916	3306	36	5859	64	167	46	196	63	1	162	42	212
1917	3727	41	6270	69	176	55	136	43	1	162	49	170
1918	4451	49	4590	50	196	60	127	39	6	165	65	133
1919	4374	52	4070	48	194	63	108	36	6	161	69	109
1920	5746	60	3772	40	211	65	107	34	6	193	67	139
1921	5855	62	3575	38	238	69	104	30	4	200	64	109
1922	6177	65	3368	35	248	73	87	26	6	194	67	94
1923	6805	67	3274	32	269	72	98	27	5	196	63	113
1924	7094	70	3006	29	265	76	84	23	6	204	70	86
Total	62264	62	49149	48	2223	60	1401	58	54	1845	64	1825

In the antepartum viable group there were 102 or 22 per cent of the whole series. Of these, seventy-three or 71 per cent were premature and twenty-nine or 29 per cent were mature. Toxemia was the most important cause of death in twenty-two of the seventy-three premature cases. This condition alone was responsible for twelve of the deaths and in the remaining ten cases there were associated conditions contributing to the fetal death. Syphilis was the cause of the antepartum death in nine instances. The causes were undetermined in twenty-three, though such conditions as maternal trauma, congenital conditions, hydrocephalus, possible syphilis may be enumerated as potential contributory causes. Multiple pregnancy occurred in five instances. There are a variety of other causes which occurred in individual instances, such as maternal trauma, malformations, maternal infections, and placental causes. There were twenty-nine antepartum fetal deaths in infants at term. In seventeen instances the cause

was obscure. In the remaining thirteen cases placental causes contributed to death in three instances, syphilis in three, extrauterine pregnancy in one, post-maturity in four, diabetes in one. In this group toxemia plays a very important rôle, especially among premature infants. Syphilis is also important, especially in the premature infants. Multiple pregnancy contributed to a considerable number of deaths among premature infants. Placental causes and malformations, maternal trauma and maternal infections are also important. There were large number of deaths due to undetermined causes in the full-term infants. Syphilis is a factor, postmaturity is a factor, and placental causes are factors of considerable importance.

The intrapartum group consists of seventy-five cases or 17 per cent of the total series. In this group there were twenty-eight premature fetuses or 37 per cent, of whom twelve died from birth trauma associated with toxemia and placenta previa in a few instances. Toxemia seemed to be the sole cause of death in three instances, syphilis in one, asphyxia due to pressure on the cord in one,

was present in twenty-four of these cases. This was associated with postmaturity in four instances, premature separation of the placenta in two, toxemia in two, placenta previa in two. Probable birth trauma was the cause of death in six additional cases. There were four additional cases of placenta previa in which complete evidence of intracranial injury was lacking. Toxemia occurred in four cases, monstrosities were present three times, probable asphyxia once, and satisfactory cause not found twice. Birth trauma is a very large factor in the causation of intrapartum stillbirths, especially among full term infants. This is not infrequently associated with other conditions which necessitate artificial induction or termination of labor.

There were sixty-two postpartum stillbirths, a percentage of fourteen. Of these, thirty-five or 56 per cent were premature, in which group were a large number of monstrosities, fifteen in all. Infection in the mother seemed to be responsible for the postpartum death of these premature infants at least indirectly in two instances. In six cases the cause could not be satisfactorily determined. There was one death in a multiple pregnancy. Birth trauma was responsible in five instances. Toxemia and placental causes were not very common. The postpartum stillbirths occurred in twenty-seven or 43 per cent of the full-term infants, birth trauma being present in fifteen of these infants, uncomplicated in three, associated with version in three, face presentation in two, and breech in one. Placenta previa occurred once. Malformations and maldevelopments of varying degrees occurred in a considerable number of instances. The main factors contributing to death among the postpartum groups are malformations and maldevelopments and birth injury occurring in spontaneous deliveries or artificial deliveries associated with the use of forceps or version as well as breech extraction.

In all in the neonatal group there were 172 cases or 38 per cent of the entire series. Of these, ninety-two deaths, 54 per cent of the entire neonatal group or 20 per cent of the entire series, occurred on the first day. Of these, sixty-seven or 72 per cent were premature. Birth trauma occurred in thirty-seven of the sixty-seven cases. The birth trauma was associated with a variety of conditions and procedures. Multiple pregnancy occurred in six instances. No definite cause was determined in

Table 6

Stillbirths, Neonatal, and First Year Infant Deaths

Year	Still Births		Neonatal Deaths		Infant Deaths		Total		Stillborn & Neonatal Deaths Combined	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1914	311	39	284	36	374	47	658	82	596	76
1916	316	36	294	36	302	36	696	70	610	72
1918	363	40	364	42	353	40	717	81	727	82
1917	313	36	332	38	283	33	616	71	646	74
1918	329	36	300	34	331	37	631	72	629	72
1919	308	36	270	33	253	31	623	64	578	70
1920	324	34	340	36	264	29	604	62	664	72
1921	346	36	314	34	217	24	631	67	660	73
1922	341	36	291	32	220	24	511	56	632	69
1923	372	37	310	32	216	22	626	64	682	70
Total	3328	36	3099	36	2813	32	6012	68	6422	73

Number of Autopsies on Still Born and New Born Infants

	1914	1916	1917	1918	1919	1920	1921	1922	1923	1924	Total
Still Born	5	7	14	23	1	1	4	7	6	94	256
Neonatal	8	23	13	16	17	21	23	32	33	94	363
Total	13	30	27	37	18	22	27	39	39	188	619

and premature separation of the placenta in one. Malformations and maldevelopments caused the death in five instances. Maternal infection was held responsible in two instances, and causes undetermined in three instances. In the term group there were forty-seven or 62 per cent. Birth trauma

eleven cases, though there was a history of maternal trauma and exposure in a few of these cases. Syphilis was proved in three instances, placental causes in two instances, asphyxia once, and major malformations once. Labor was induced twice because of toxemia. Death from exposure occurred in two cases. Artificial procedures for induction and termination of labor were used in five instances. There were twenty-five or 27 per cent full-term infants dying on the first day, of which birth trauma contributed to the death in fourteen, being associated with toxemia in one instance. Artificial procedures were adopted in five of these deliveries. Placenta previa occurred in one case. Malformations and maldevelopments occurred in seven instances. These were not all sufficient to be the sole cause of death. There were hemorrhages, traumatic and accidental, in two cases. There was no instance of hemorrhagic disease in this group.

In the later-day deaths there were eighty cases, 46 per cent of the neonatal group or 17 per cent of the entire series. Of these there were twenty-nine deaths, or 36 per cent, in premature infants. Birth trauma contributed to at least four of these deaths, hemorrhagic disease to two deaths. Infections such as broncho-pneumonia and gastro-intestinal infections were found in nine instances, maternal toxemia in two instances, and placental causes in one instance. Congenital malformations and maldevelopments were found in five cases. Starvation was responsible for death in one instance. Multiple pregnancy occurred in one instance. No definite cause was determined in three cases.

Of the full-term infants there were fifty-one deaths or 64 per cent. Birth trauma was a definite factor in twelve instances. This was associated with other conditions in eight cases, among which hemorrhagic disease was present twice and syphilis once. Congenital malformations and maldevelopments were found in ten instances. Various infections were responsible for deaths in thirteen instances. Hemorrhages as a cause of death were found in seven cases, three of which were traumatic in origin. Hemorrhagic disease was responsible for at least three deaths. There were two instances of duodenal ulcer. There was one case of melena which originated from a duodenal ulcer. Cause of death was not determined in three in-

stances, in one of which there was a question of infanticide.

The deaths occurred in the following numbers on the different days: (1) premature group, second day, ten; third day, one; fourth day, four; sixth day, three; eighth day, two; ninth day, two; tenth day, three; eleventh day, three; and fourteenth day, one; (2) mature group, second day sixteen; third day, four; fourth day, seven; fifth day, one; sixth day, three; seventh day, four; eighth day, one; ninth day, four; tenth day, two; eleventh day, four; twelfth day, two; thirteenth day, two; and fourteenth day, one.

The causes of death on the different days in the neonatal group are as follows: For the premature group death from various infections occurred on the second, fourth, sixth, eighth, ninth, tenth, eleventh, and fourteenth days. The deaths from congenital malformations and maldevelopments occurred on the second, third, and tenth days. Deaths from birth trauma occurred on the second, fourth, and sixth days; association with placenta previa on the second day; maternal toxemia on the second and tenth days; multiple pregnancy on the second day; hemorrhagic disease, second and sixth days; malnutrition on the eleventh day, and icterus neonatorum on the fourth day. In the full term, deaths from infections occurred on the fourth, sixth, seventh, ninth, tenth, eleventh, and thirteenth days; congenital malformations and developments on the second, third, fourth, seventh, eighth, twelfth, and fourteenth days; from birth trauma on the second, third, seventh, and ninth days; hemorrhagic disease on the second, fourth, and sixth days; gastro-intestinal hemorrhages on the fourth and second days; other hemorrhages on the second, fourth, and sixth days; cause undetermined on the fourth day, associated with convulsions, fifth day, icterus, and thirteenth day, probable infanticide.

CONCLUSIONS

1. In order to reduce the loss of life due to fetal and newborn deaths we must be in a position to furnish proper prenatal care during as great a part of pregnancy as possible. In this way we can in a measure reduce the number of premature terminations of pregnancy with dead- and live-born infants.

2. When premature births of living infants occur we must be in a position to furnish special

and adequate care to them in order to maintain their lives.

3. We must practice preventive medicine by careful observation of our pregnant women, and by early detection and control of toxemias of pregnancy, not only in the interest of the mother but also of the unborn fetus.

4. We must detect and treat syphilis before pregnancy occurs or during the early period of gestation.

5. We must so conduct labor as to lessen the violence of uterine contractions in short, hard labors and lessen the fetal trauma incident to the prolonged labors and in those requiring artificial termination.

6. We must so conduct the post-natal stage that the newborn infant is subjected to a minimum of exposure and the least possibility of infection.

7. Lastly, we must unravel the causes and means of prevention of death of those fetuses which die as a result of malformations and from the thus far undetermined causes. These results can be obtained only by the painstaking application of such knowledge as we have, and by the carefully conducted and thorough investigation of unknown factors and causes which will ultimately place us in a position to secure even better results than it is possible to obtain with our present knowledge and practice.

(N. B.—Most of the autopsies have been performed by Drs. W. A. O'Brien, D. C. Mibane, R. L. J. Kennedy, Edith Boyd and Ethel Harrington.)

DISCUSSION

DR. W. A. O'BRIEN (Minneapolis): I wish to demonstrate a simple method for doing an autopsy on a fetus. In estimating the age of a fetus or newborn infant, the length is taken in inches or centimeters and the result divided by 2 or 5, respectively. This fetus is 14 inches in length. Dividing by 2, we have 7 months, the age in lunar months.

A thorough examination of the body for any sign of malformation or injury should be made. In this case none is found.

A special point is made of the manner of making the incision on the anterior surface of the body. The incision from the point of the chin to the symphysis pubis is unsatisfactory, because it is impossible to conceal the upper portion for burial. In the method employed here a curved incision is started from the junction of the anterior axillary fold with the shoulder and carried downward through the third costo-chondral articulation to a similar point at the opposite shoulder. A longitudinal incision is made from the lower margin of the first to the symphysis pubis. The skin is reflected backward and the peritoneum incised.

The first thing that strikes the attention on opening the peritoneal cavity is the size of the liver. The liver of the newborn is very large, and this is not an abnormal one. The size of the spleen is next ascertained, as enlargement is very suggestive of syphilis. In this case a small spleen is found.

The thorax is opened by cutting the ribs with scissors. This affords a view of the lungs, thymus and heart in position. The thymus in this case is normal in size and position, as it occupies only the upper portion of the mediastinum. The lungs are dark blue. If any air is present, the lungs are usually bright pink. In partial expansion these pink areas are frequently limited to the anterior margins of the upper lobes. No expansion has occurred in these lungs. In addition, we see a large number of small bluish black hemorrhages on the pleural surfaces. These resemble those shown by Dr. Adair in one of the first slides and indicate that suffocation has taken place. It is to be remembered that suffocation is a manner rather than a cause of death and may take place either in or out of the uterus.

The anterior surface of the heart is inspected in position. The interventricular septum is located by finding the coronary vessels, which pass from the atrio-ventricular junction to the apex. The auricles are normal in size and position. By passing a probe from the ventricles into the pulmonary artery and aorta, obstruction can be excluded. The probing may be continued and the patency of the ductus arteriosus tested. This is always open at the time of birth and for several days afterward. The heart is next opened and the valves, interventricular and interauricular septa inspected for defects.

The lungs are next removed by cutting the bronchi and vessels. The presence of foreign material in the bronchi may be detected by squeezing the lung. In this instance I get a few bubbles of air that has been taken in either by the fetus or forced in by artificial respiration.

The liver is next removed. On section marked congestion is noted.

The intestinal tract is now removed. Malformations are seldom the cause of death at this age but hemorrhage is always a possibility. Blood, if present, can usually be seen within the bowel through the serosa. The amount and position of the meconium should be noted, as increased peristalsis apparently takes place as a result of asphyxia and the contents of the bowel may be concentrated in the sigmoid.

The adrenals are next removed. They are large in the fetus and newborn and show the usual softened, hemorrhagic condition.

The kidneys are normal in size and position. They should be removed in connection with the ureters and bladder, so that obstruction can be determined. When the capsule is stripped off, a lobulated surface is evident. Marked congestion is found but no hemorrhages. On section the same congested condition is apparent.

The head is next examined. In order that the incision may not show, it is carried well back over the dorsal surface. The scalp of the fetus and the newborn is very loose, so that this will not interfere with the opening of the head. The incision should be started just behind one

ear and carried to a similar point on the opposite side. The scalp is next peeled forward and backward. A moderate amount of hemorrhage and diffuse edema are found here. This is seen in practically every fetus and newborn infant. The periosteum is next inspected for hemorrhage and injury. Only a few small hemorrhages are found in this case.

The older method of opening the skull did not afford a good opportunity of examining the dural folds. As their condition is frequently an index of the severity of labor, their examination is very important. We use the method developed by Beneke in 1910. One parietal bone is opened by starting the scissors near the anterior fontanel and the outline of the bone followed. The dura should be left intact if possible and opened separately. This affords a view of the brain which we could not otherwise get. In this case we find a diffuse hemorrhage and marked edema of the pia arachnoid. The cerebral hemisphere is next removed by passing the finger forward and backward. It is lifted out and the fossæ inspected. A small amount of blood-tinged cerebrospinal fluid is present in this case. Care should be taken not to injure the choroid plexus. I find a large hematoma in the lateral ventricle on this side. This is a very common form of intracranial hemorrhage in premature infants. The tentorium is examined and no injury found.

If the body is to be buried, we frequently remove the other cerebral hemisphere through the single opening. The cranial cavity is stuffed with cotton and the bones united with a single suture. The scalp can be neatly sutured and restoration is good. The other half of the brain is examined and no evidence of injury is found in the tentorium. A small amount of blood-staining of the pia arachnoid is present.

The tentorium is incised and the medulla and cerebellum inspected.

The neck may be examined by a posterior incision. Hemorrhage in the soft tissues is usually an index of injury to the vertebrae and a careful search should be made if this is found.

Examination is not complete without inspection of the epiphyseal lines for evidence of syphilitic osteochondritis. This is done by sharply flexing the knees and making an incision through the soft parts and cartilage of the lower end of the femur. The bone is soft enough to continue the incision into the shaft. The normal line is sharp and thin. The appearance of the syphilitic bone is usually characteristic: a wide, irregular, yellow, granular structure is seen.

A section may be taken from each organ for further examination. The contents of the various body cavities are replaced and the incisions sewed up.

Summarizing the findings in this case, we have a seven months' premature fetus in whom respiration did not take place. Death probably occurred during or immediately following delivery. The hematoma in the choroid plexus of the right lateral ventricle is traumatic in origin and probably occurred as a result of the natural forces of delivery, precipitate labor or breech extraction. The intense congestion of the viscera and the small hemorrhages of the pleura

and epicardium indicate that the asphyxial type of death took place.

DR. R. L. J. KENNEDY: In a problem of the scope of that on which Dr. Adair has been engaged, there have come up many facts which, though not bearing directly on the main problem, yet are of considerable interest. The conditions that were found in the gastro-intestinal tract in this series of necropsies are examples, and these I had an opportunity of studying with him.

The conditions found were, briefly, as follows: (Lantern slides were used to illustrate each.)

Two cases of atresia of the esophagus with tracheo-esophageal fistula. The upper esophagus ended in a blind pouch at the level of the bifurcation of the trachea and at that point there was a communication between the trachea and esophagus.

One case of atresia of the duodenum. The stomach and first portion of the duodenum were very markedly dilated, the point of obstruction being near the papilla of Vater. The child died on the third day.

Two instances of congenital volvulus, one accompanied by fecal peritonitis. The specimen displayed shows the complete rotation of the intestine on itself.

One case of atresia of the jejunum. The jejunum ended in a dilated blind pouch separated entirely from the lower segment of bowel at the point of atresia.

One case of imperforate anus with atresia of the rectum.

Two duodenal ulcers were also found in infants dying from melena. At necropsy, in the first instance, an ulcer was seen measuring about 0.5 by 0.5 cm. The microscopic sections show the normal mucous membrane at the edges, the crater filled with necrotic tissue, a central thrombosed vein, and the leukocytic reaction. The other case was similar in all respects and the lesions practically identical. The crater extended to the muscularis, and contained necrotic tissue with considerable fibrin on the surface. There was a large amount of leukocytic infiltration and, in the center, two thrombosed vessels were found. Both of these infants had normal coagulation and bleeding times and neither showed bleeding from any other parts of the body.

Another case which was studied recently showed several unusual features. The infant bled from the umbilical stump on the first day of life. The second day it began to pass dark red stools and vomited a small amount of dark reddish material. The coagulation time in this instance was normal but the bleeding time was prolonged to about three hours. In spite of transfusion, the infant died on the fifth day, later than most of those we have seen.

At necropsy nothing was found grossly, except a small submucous hemorrhage in the duodenum. It was only on microscopic examination that the suspected lesion was demonstrated. There was an ulcer in the duodenum, the crater of which was filled with a large amount of granulation tissue and fibrin, into which the organizing elements were entering. At the edge of the ulcer tangential sections showed the epithelial cells completely covering the granulation tissue.

These cases have furnished excellent material for the study of melena and its relation to duodenal ulcer.

THE USE OF NOVASUROL AS A DIURETIC*

HARRY OERTING, M.D.

St. Paul

Novasurol was originally introduced to the medical profession as an antisiphilitic. Later it was noted by Poelcher and Saxl that cases of aortic regurgitation with marked decompensation rapidly became edema-free under novasurol, although all the known diuretics had previously been used without any appreciable effect. This finding was the beginning of a study of the drug as to its diuretic properties, and about nine months ago I began to collect a series of cases for study.

Novasurol is the double salt of sodium oxymercuri-o-chlorophenoxyacetate with diethylbarbituric acid and contains 33.9 per cent of mercury in a complex non-ionizable combination.

The drug is furnished in a 10 per cent neutral sterile solution and may be given either intravenously or intramuscularly. From my experience there is nothing to be gained by the intravenous method and it does have decided disadvantages. At this point I would like to say that there is altogether too much promiscuous intravenous therapy and unless there is a valid reason for the intravenous route it is far better to choose some other method of medication.

The dose of novasurol varies from 0.5 c.c. to 3 c.c., and the interval between injection varies from three to seven days, according to the results and reactions obtained.

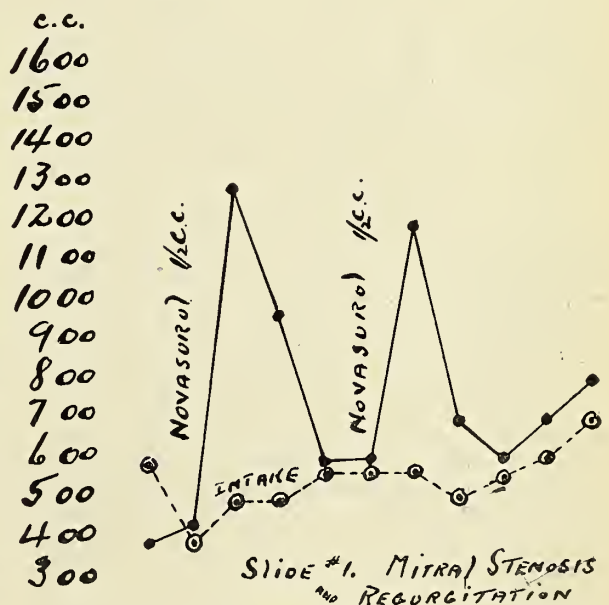
The physiological action of this drug is little understood and the literature gives but a scant suggestion as to how it acts. One theory advanced is that in part at least there is a direct action upon the tissues of the body with the extraction of H_2O and $NaCl$ from their colloidal combination; another that it acts directly on the tubular elements of the kidneys, thus increasing the elimination of fluid. Keith and Whelan have shown that novasurol produces an increased excretion of sodium and chlorine in the urine, but are unable to say whether this specific reaction is due to its action on the kidneys alone or on both kidneys and tissues generally. Clinical experience, however, teaches us that the kidneys must have functional

activity. The diuretic effect begins about two hours following the injection and continues from twelve to twenty-four hours.

Novasurol is especially indicated in decompensated cardiac cases and it produces results where a faithful trial of all the ordinary diuretics has failed. Cardiorenal cases with a fair functional activity respond readily. The drug is also recommended in the treatment of the edema and ascites due to cirrhosis of the liver, carcinoma, pleural effusions and tuberculosis.

Absolute contraindications are renal edema, nephritis and enteritis.

Too large a dose, or even a small dose in susceptible individuals, may bring on headache, vertigo, nausea, vomiting, stomatitis, diarrhea, febrile reactions and scarlatinal eruptions. In my experience the only reaction of any consequence is the diarrhea, and this may assume distressing proportions, going on to a stage of acute colitis with mucus, blood and extreme tenesmus. Fortunately, the condition is quite readily controlled with bismuth and paregoric.



I will not burden you with a lot of statistical material covering the various cases studied, but merely present a few brief case reports showing the effects that can be secured and to report the failures in the hope that it will stimulate interest in this useful preparation.

*Read before the Minnesota State Medical Association, Minneapolis, April, 1925.

CASE REPORTS

Case 1.—O. N. A cardiorenal case with tremendous edema of the legs, thighs and scrotum. The penis and scrotum were so edematous that the patient could not urinate and it was impossible to pass a catheter. A determined effort had been made for several days to reduce the edema but all the commonly known diuretics, digitalis and bowel elimination failed to produce results. One c.c. of novasurol was given intramuscularly and there was a prompt response with marked diuresis and a bloody diarrhea with extreme tenesmus. Within twelve hours the edema had decreased sufficiently so the patient could urinate freely. The diarrhea was readily controlled by bismuth subcarbonate and paregoric in teaspoonful doses of each. Three days later another cubic centimeter of novasurol was given along with prophylactic doses of bismuth and paregoric. The diuresis began promptly and continued for forty-eight hours and there was no bowel disturbance of importance. Forty-eight hours after the last injection the edema had disappeared except for a slight pitting of the ankles. This residual gradually disappeared and the patient was edema-free for several weeks and then relapsed with a slight edema which cleared up immediately on the injection of 0.5 c.c. of novasurol. Owing to the nature of the reaction in this case it was not possible to secure accurate intake and output records and I cannot show a graphic representation of the diuresis.

Case 2.—W. T. Mitral stenosis and regurgitation with marked edema and ascites. The third admission to the hospital for the same condition. On previous admissions it had taken several weeks to reduce the edema. This patient, a girl 12 years of age, was given 0.5 c.c. of novasurol intramuscularly. There was a profuse diuresis but no by-effects. Three days later another 0.5 c.c. was given and in forty-eight hours the patient was edema-free and left the hospital under protest. Slide No. 1 shows a graphic representation of the intake and output.

Case 3.—J. R. This patient entered the hospital with a right hemiplegia and was unconscious for several days. When he regained consciousness he had a motor aphasia which persisted. Later there developed a marked edema of the affected arm and leg and the scrotum was also involved. Under the usual regime the edema increased and he was given 0.5 c.c. of novasurol at three-day intervals for three doses and the edema entirely disappeared.

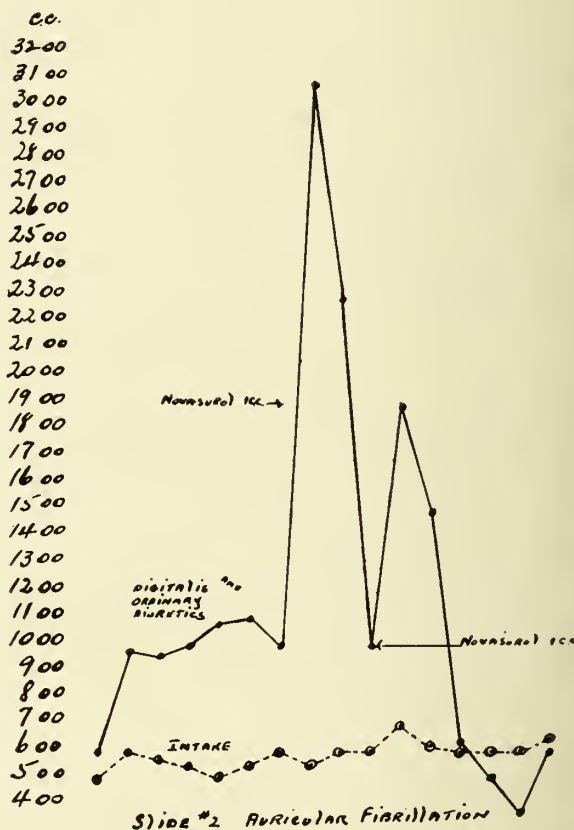
Case 4.—M. T. Chronic cardiovascular disease, double mitral and aortic lesions of rheumatic origin with decompensation. Under the usual regime and diuretics the edema did not entirely disappear and there was a slight edema of the ankles and lower legs. Two 0.5 c.c. doses of novasurol at three-day intervals removed all the edema and it has not returned.

Case 5.—A. R. Auricular fibrillation with chronic myocarditis, and a tremendous edema and ascites which failed to respond to the usual routine of digitalis, theocine, restricted fluids and bowel elimination. Slide No. 2 shows diuretic effect secured with 1 c.c. doses of novasurol at three-day intervals, following which there was practically no edema. Fourteen days after admission the patient became suddenly cyanotic and died almost at once from an apparent acute cardiac failure. Autopsy was refused.

FAILURES

Case 1.—M. B. Paroxysmal tachycardia with an old chronic myocarditis and marked decompensation. Novasurol in 0.5 c.c. doses produced no results. Pushing to salivation and diarrhea still gave no results and the edema steadily increased. Blood chemistry studies gave approximately normal readings.

Case 2.—W. M. Chronic valvular heart disease of many years' standing with fibrillation and decompensation. All the ordinary diuretics were used without effect. Three doses of novasurol at three-day intervals produced no diuresis and owing to salivation the drug had to be discontinued.



Case 3.—T. M. Terminal edema and ascites in pulmonary tuberculosis. Only one case came under observation and was not influenced by novasurol.

Case 4.—T. H. Carcinoma of the stomach with general carcinomatosis and considerable fluid in the abdomen. A thorough try of novasurol gave no appreciable results. The ascites remained the same and although there were no untoward results he surely did not derive any benefit.

Case 5.—B. S. Cirrhosis of the liver with marked edema and ascites. At first there were very satisfactory results with novasurol and the edema and ascites practically disappeared. Relapses occurred and were controlled for some time but finally there was little or no relief afforded and the patient died. Slide No. 3 shows effect secured with the early doses.

In conclusion, I wish to express my appreciation to Drs. James Hilton and H. A. Raus of the Ancker Hospital Interne Staff for their valued assistance in this study.

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DISCUSSION

DR. N. M. KEITH, Rochester: That this mercury compound is a wonderful diuretic I think you will all agree after seeing these slides of Dr. Oerting's. We have had some really marvelous results in all types of ascites and edema. It is just about ninety years ago now that Richard Bright, in his famous monograph on nephritis, discussed at length the question of the use of mercury in renal dropsy. He states that in spite of certain remarks made by Mr. So-and-so of Bristol he felt that any compound of mercury was more harmful than beneficial in renal dropsy.

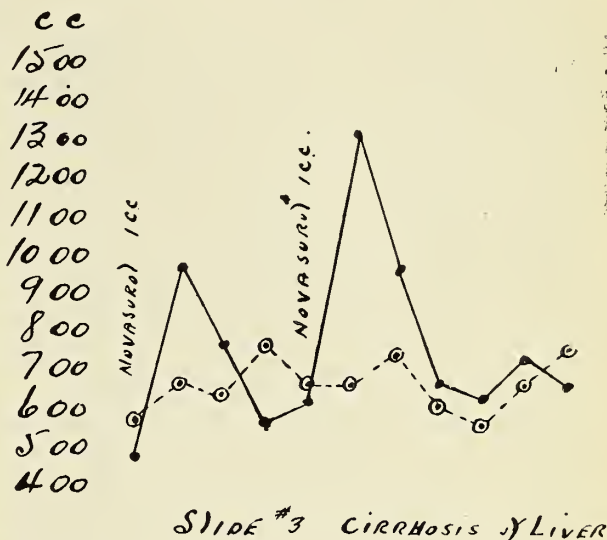
Now we have obtained in certain types of nephritis (and I wish to qualify my remarks by specifically stating certain types of nephritis) just as remarkable results as Dr. Oerting has mentioned today in cardiac edema. We have now had four such cases of nephritis. Knowing Bright's dictum, I had great hesitancy in using the drug, but in these four cases we have had striking effects. I might just review the history of one of the patients.

This girl was about twenty years old, and had had edema off and on for eight years. In the last year this had been rather more severe and more diffuse. She got definite relief on one occasion by the use of calcium chlorid, on another occasion by the use of ammonium chlorid, but on the third occasion the ammonium chlorid failed to produce the desired effect. I then gave her novasurol, and in four doses her weight was reduced from about 160 pounds down to 143, a remarkable drop in weight, with entire loss of edema. We could find no evidence of any disturbance of renal function or any other harmful effect. In my experience that is a remarkable effect and shows that the drug has wonderful possibilities.

Dr. Oerting states that he gets varied effects: certain patients do not react at one time, they react at another, while others do not react at all. In this question of the treatment of edema we have found that in addition to this drug there are two other therapeutic measures which are of great importance. First is the question of diet. In diabetes for instance we cut down the carbohydrates because we know the body cannot use them. In edema and in ascites, when we know that the body cannot use fluids, nor salts, why for similar reasons shouldn't we cut down the fluids and the salts in diet? By methods such as these we now have a diet in which the fluid intake is low, the content of the different ions is low, and in very resistant cases we have

found that with the use of this diet alone we have been able to start diuresis and cause the excess fluid to be excreted.

The second therapeutic measure is the use of acid-producing salts, such as calcium chlorid and ammonium chlorid. These salts act in a very curious way. We are not absolutely sure of what the exact mechanism is, but we do know that they make the blood and tissue fluids more acid and increase the chlorid content. Their action may in some



way be due to this change in hydrogen ion concentration in the body. We have found that in certain cases where we cannot produce diuresis with the diet and these salts, novasurol is effective. We have also noted, in certain cases where novasurol had been ineffective, that after using the diet and the acid-producing salts extraordinarily good results were obtained with novasurol.

Novasurol specifically takes out sodium and chlorin from the body. That has been shown in normal individuals, in the dog and in the rabbit. That is a very unique, specific function. Two normal men were given this diet and novasurol. In one, diuresis resulted. That had been noted previously by two German workers, Mühlhling and Nonnenbruch, but in one of our men we found that we got this increased excretion of sodium and chlorin without increased excretion of water. That brings up one of the fundamental considerations of this diuretic problem. Blum, as some of you know, has stated that edema is due to retention of sodium. Widai previously had enunciated the doctrine that it was due to retention of sodium chlorid. We now know that Widai was partly wrong, that sodium is one substance which is specifically associated with retention of water in the organism.

How novasurol actually extracts sodium and chlorin from the tissues is obscure. It would seem that there is a definite effect on the kidney, and its entire effect may be thereby entirely explained. I am rather inclined to believe from certain work that we have done that there is a diffuse effect on the tissues.

These newer diuretics are producing clinical effects that are in certain cases startling. They have given us thera-

putic levers of which three years ago we did not realize the possibilities.

THE CHAIRMAN (Dr. L. G. Rowntree): I am going to take the liberty of asking Dr. Keith to explain the administration of ammonium chlorid. So far as I know he is the first to utilize this in adults, and there is a definite technic. It is extremely important in handling resistant cases of edema, and I think it would be worth while for him to say a word or two about the dosage.

DR. KEITH: Calcium chlorid as you know has been used now for probably three or four years in the treatment of edema. It produces a decrease in the alkali reserve and an increase in the amount of chlorin in the body. Haldane has shown on himself that he got a similar result with ammonium chlorid. Ammonium chlorid is much more easily taken by the patient than calcium chlorid. We have found ammonium chlorid readily taken in cases where calcium chlorid was absolutely intolerable.

It is a large dose. Anywhere from 5 to 10 gm. is required for a satisfactory effect. Within forty-eight hours there is a decrease in the alkali reserve of the body fluids, and a marked increase in the acidity of the urine. In about half the cases of edema or ascites a definite diuretic effect is produced. In the other 50 per cent there may be slight effects or none at all. We have given one patient 170 gm. over a period of eighteen days without any harmful effects. In cases of edema without other serious renal insufficiency except inability to excrete salts and water, the ammonium chlorid can be safely given. By further use of novasurol in these cases some wonderful effects are produced. There is danger only when there is marked retention of urea. We had one such case with the blood urea 170 mg. The patient was extremely ill. We were very anxious to help the patient. We tried digitalis, theocin and other diuretics without avail. I suggested that we begin with 5 gm. of ammonium chlorid. We gave her such a dose for five days. At the end of that time she displayed typical Kussmaul respiration, had a combined carbon dioxide capacity in the blood plasma of 9 volumes per cent, and very severe acidosis. Happily we were able to control the acidosis by the proper use of alkali.

THE CHAIRMAN (Dr. Rowntree): I had hoped that a little more would have been said about cirrhosis of the liver. In fact, for many patients who have come with the idea of having an operation, we have found it possible to remove the ascitic fluid entirely by the use of novasurol, and particularly by this combination which Dr. Keith has discussed. It is not effective in all cases but in a large percentage of cases of cirrhosis of the liver it is perfectly feasible to treat the ascites with this drug. I think that is something that is very practicable and that every practitioner should know about. Dr. Billings says that he is interested in this subject. We would like to hear from him on it.

DR. FRANK BILLINGS (Chicago): I am interested in it, interested of course in finding a new remedy, but like many other things this is only a new form of mercury. More than sixty years ago Wagner, the great pathologist, who was a clinician also, brought out the fact that mercury when properly exhibited in certain types of dropsy was one of the best means of overcoming it, and to use calomel

in either small divided doses or in maximum doses, always sufficient to produce a diarrhea before results can be expected. When I was a student this was practiced.

After Wagner's statement of the effect of mercury in dropsy came the Niemeyer pill. Among you older men you know all about the Niemeyer pill, which was composed of one grain of mercury, blue mass or calomel, one grain of digitalis, and one of ipecac, to be exhibited two or three or four times a day in these cases. Now, don't forget that mercury, the old-fashioned reliable measures that are non-dangerous, can be used in these patients. That doesn't say anything about the use of the new and what seems to be a very favorable therapeutic agent.

Now, may I just take your time to say one thing more? We know something about dropsy but we don't know all. We do know that under certain conditions the kidney may not be a good filter and dropsy results. But there may be a physicochemical cause for dropsy. This was pointed out by Martin Fischer, professor of physiology, University of Cincinnati, a good many years ago and ridiculed, but the work that he has done has been reinvestigated by splendid workers and it has been verified that in certain toxic conditions of the body the colloids of the body acquire an affinity for water, and dropsy results.

For example, how many times do you see some patient, often children with an acute infection of some sort, and suddenly they have general dropsy, the urine shows albumin, but under proper treatment of getting rid of the infection the dropsy soon clears up and the kidneys are cleared up. The toxemia, whatever it was that produced the condition of the body colloids that made them hold water, also affected the kidneys for the time being. Or on the other hand, we as practitioners years ago with a child in hot weather with a diarrhea of infancy tried to stop the diarrhea due, as believed, to a morbid condition of the bowels. It is now proved that in many instances it is the condition of the colloids of the body that won't hold the water and diarrhea results.

Now, what has been said about chlorids and their relationship to all of this is probably true, but in our taking up with new things don't let us forget the old substantial things. That's what I wanted to say to you. I am old enough in medicine to have remembered a lot of these things in old books, but I am beginning to read them over and over again. In reading recently some of the old English books, Guy's hospital reports, it is astounding the number of things we call new things clinically today that were practiced a hundred years ago.

DR. HARRY OERTING (closing): The only thing I would say in closing is: Be careful of your dosage when you start out. Don't get ambitious and give the patient a c.c. or two c.c. Always start with 0.5 c.c. dose or you will get yourself into a lot of trouble.

There is another point in the use of novasurol that is very startling clinically and that is the marked improvement in the ascites and edema of the patient which apparently cannot be accounted for by the amount of their output. The improvement is so rapid that the figures in the column of your intake and output do not tell the whole story. There is more to it than that.

I wish to express my appreciation to all for their kind discussion.

THE PREVENTION OF INDUSTRIAL LEAD POISONING*

THIRTEEN MONTHS' EXPERIENCE AMONG STORAGE
BATTERY WORKERS

PHILIP F. DONOHUE, M.D.

St. Paul

Industrial lead poisoning, the most prevalent of all occupational diseases, presents a worthy problem for preventive medicine. One hundred and fifty trades use this dangerous metal and will continue to do so until a substitute has been found. For this reason, industries using lead on a large scale should be medically supervised in order to protect the worker from this insidious disease.

The manufacture of storage batteries is one of the most important sources of poisoning, since it brings an unskilled, constantly changing class of workmen into contact with a series of dusty processes. In this work the monoxide or litharge, PbO , and red lead, Pb_2O_4 are used, both having a marked tendency to form dust. These oxides are mixed into pastes and kneaded into the meshes of lead grids which are dried and polished and "formed" by passing an electric current through them. The air of the work-rooms soon becomes filled with fine dust particles which gain easy entrance to the body during inspiration. Of less importance are the fumes of the lower oxides that arise from burning lead in casting grids and assembling batteries. Legge and Goadby showed by a series of experiments that lead poisoning could be produced by the entrance of fine particles through the respiratory tract. To one group of cats, lead was fed by mouth, and to another, small amounts were daily blown into the lungs through a tracheal tube. The latter group was found to develop symptoms of poisoning far earlier than were those to whom the administration was by the gastro-intestinal route. It is probable that lead enters through both tracts, although it is conceivable that greater chances for absorption await particles that reach the lung alveoli.

The old ideas that laid the cause of plumbism to lack of cleanliness on the part of the workers have been cast aside. It was supposed that lead was ingested with food by failure to wash the hands

before eating. Small amounts only could be absorbed in this way, but the worker breathing fifteen times a minute in a dusty atmosphere, day after day, would have ample opportunity to take in sufficient lead to cause poisoning in a short time. The International Labor Organization has estimated that as little as two milligrams (.002 gm.) taken into the body daily will in time cause poisoning.

After absorption, most of the metal is excreted by the biliary and renal systems and by the lower bowel, and the fraction retained is transported by the blood stream to the bony framework, where it is stored. When sufficient amounts have been absorbed or when metabolism is upset this stored portion may again enter the blood and produce plumbism. No trouble is encountered as long as a balance between absorption and elimination exists.

The pathology of lead poisoning concerns chiefly the circulatory, gastro-intestinal, and neuromuscular systems. In the circulatory system the blood exhibits characteristic changes during the period of lead absorption, as well as in the stage of actual poisoning. There is a reduction of the number of red cells and the percentage of hemoglobin and the occurrence in the blood stream of regenerative red cells containing basophilic substance.

A significant finding of the gastro-intestinal system is the blue line on the gums. Its presence indicates that absorption has taken place, but not of necessity in sufficient amounts to cause poisoning. Its absence means nothing in determining the presence of lead absorption or even lead poisoning. It is very often found in workers who practice no oral hygiene, and for this reason care must be taken not to confuse a true lead line which is intragingival with a false one which is on the gums and removable. The causes of abdominal colic are variously given as vaso-constriction of the splanchnic vessels, irritation of the solar plexus, and muscular spasm of the intestinal wall.

The most frequently met neuromuscular lesion is that of peripheral neuritis which is manifested by wrist drop. Encephalopathies and visual disturbances occur infrequently and have not been seen by us in our thirteen months' experience.

The onset of plumbism is characterized by generalized colicky pain in the abdomen—mild at first, but finally severe, and usually associated with constipation of one or more days' duration. Abso-

*Read before the May meeting of the staff of the Miller Hospital, St. Paul.

lute obstipation follows unsuccessful attempts at catharsis, and nausea and vomiting occur. With the start of active elimination by bowel these symptoms subside, but may not entirely disappear for some time. Often a second and even a third attack takes place before the case can be dismissed as cured.

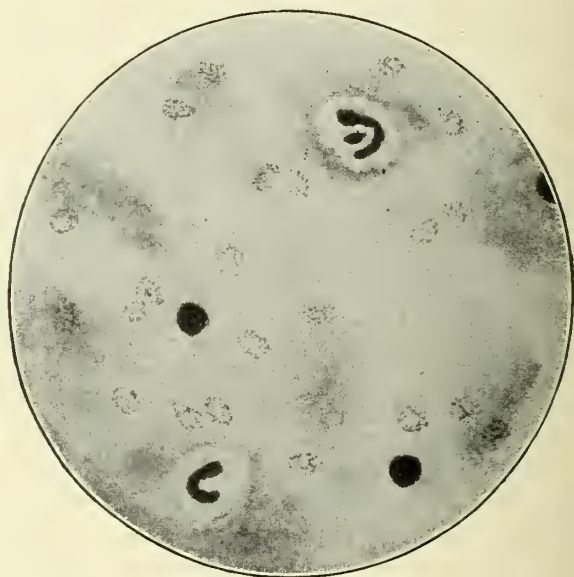
Facial pallor, blue line on the gums, and elevation of blood pressure are sometimes present, but just as often absent. Wrist drop usually occurs after two or more attacks and may develop without previous gastro-intestinal seizure. It is preceded by stiffness and loss of power of extensors of the wrist. Complete paralysis follows, causing a disability of many months' duration.

The problem of prevention concerns the control of the dust and fume hazard, and the medical supervision of the workmen. Under bad conditions the majority of those exposed will eventually become victims of this disease and, conversely, under comparatively good conditions, with a minimum of dust and good ventilation, but without medical supervision, a good number of workers will also become sick. The factor of idiosyncrasy is present here just as in the production of other human ailments. This factor can often be discovered in the stage of lead absorption, before the onset of symptoms, by periodic medical examinations. A tendency toward the disease is sometimes ascertained by careful questioning of applicants for position.

Dust is diminished by providing large, airy rooms for the dangerous processes. These rooms are equipped with exhaust ventilators and scrupulously cleaned several times a day. All workmen engaged in dusty work are given respirators and required to wear them at all times. Under these conditions a minimum of lead gains access to the body and the balance between absorption and elimination can generally be maintained.

In addition to a careful history, applicants for work are examined physically to determine their fitness for this hazardous occupation. They are told the dangers and instructed how to avoid them. Emphasis is placed on the occurrence of daily bowel movements and each worker is required to provide himself with Epsom salts to be taken at the slightest indication of impending constipation. The intelligent man with an average physique seldom becomes a victim if he applies these principles.

All workers are examined at frequent intervals to discover signs of lead absorption and to estimate the degree to which it has taken place. These examinations are done as often as seem necessary in each individual case and include a red cell count, hemoglobin estimation and a blood smear examination after the method of McCord of Cincinnati. McCord contends that there is present in the blood, in plumbism, red cells containing basophilic substance. These are of three kinds: (1) Preformed stippled cells; (2) polychromatophilic cells (both easily stained by Wright's method); (3) many other cells containing basophilic substance which cannot be detected by ordinary staining methods. Often stippling and polychromatophilia are not found even after a diligent search throughout an entire slide, and, for this reason, a means was developed to obtain "visibility of cells containing basophilic substance." A



Basophilic aggregations after hemolyzing staining method; blood from worker with advanced lead absorption; diagrammatic. Jour. Am. Med. Assn. Courtesy of Dr. McCord.

few drops of solution of 0.2 grams methylene blue and 0.5 grams borax in 100 c.c. distilled water are placed on a slide containing a uniformly thick blood smear, and allowed to remain ten minutes. Hemolysis of the red cells takes place and there remain besides the white cells and platelets, aggregations of basophilic particles visible for the first time. The number of aggregations in ten fields is counted to serve, in conjunction with the red count and hemoglobin, as a criterion of the degree of

lead absorption. Non-exposed or new workers seldom have higher than eight basophilic aggregations in ten fields, while counts of one hundred or more are often made in cases presenting the clinical picture of lead poisoning. This test has been of great service in indicating the absorption of lead beyond safe limits. If a progressive fall in red count and hemoglobin and a rise in basophilia are found in a worker, he is immediately changed to non-hazardous work. In some cases a rise in basophilia is the only finding even after a long exposure. If the worker is not removed, the red count and hemoglobin fall and the basophilia increases further. Constipation and loss of appetite are complained of and the stage of pre-plumbism is reached. No trouble occurs if active catharsis is instituted and the man is changed to outside work. However, it is seldom necessary to postpone intervention so long, if examinations are done frequently and reliance placed on the comparative blood findings.

The blood findings of four cases selected from several hundred are herewith presented. The amount of lead absorption can be determined by comparing each examination with those preceding.

Case 1.—G. P. Age 20. Pasting department.

Exposure began July 8, 1924.

R.B.C. Hb. B.A.

7-16-24 G.P.	5,160,000	97%	14	Feels well
8-11	5,200,000	91	22	" "
9-29	5,770,000	92	31	" "
10-10	4,570,000		34	" "
10-22	5,020,000	87	82	Non-hazardous work
12-13		92	3	Feels well
3-27-25	5,450,000	92	6	" "

Case 1 was removed from exposed work after the fifth examination with a finding of 82 basophilic aggregations and a fairly normal red cell count and hemoglobin percentage. The basophilia was seen to return to normal on subsequent examinations. Instances of this kind are many, and illustrate the value of the basophilic test in furnishing us with signs of lead absorption beyond safe limits. Preventive measures are then started before symptoms develop.

Case 2.—S. D. Age 22. Pasting department.

Exposure began April 15, 1924.

R.B.C. Hb. B.A.

5-13-24	5,160,000	84%	Not taken;	feels well
7-31	3,910,000	63	64	Non-hazardous work
9-15	3,920,000	64	19	Left employ; feels well

Case 2 was changed to non-hazardous work after an exposure of fourteen weeks, because of blood findings. He had no complaints. Six weeks later a sharp decline in basophilia had taken place with no appreciable changes in hemoglobin and red cell count.

Case 3.—A. S. Age 22. Pasting department.

R.B.C. Hb. B.A.

8-29-24	5,460,000	93%	11	Feels well
10-3	5,020,000	85	100	Abdominal pain, constipation

In Case 3 an attack of abdominal pain and constipation occurred after an exposure of six weeks to lead dust. Essentially normal red cell count and hemoglobin percentage, with a very high number of basophilic aggregations, were found. The basophilic aggregation was a diagnostic aid in this case.

Case 4.—W. A. Age 24. Pasting department.

Exposure began October 23, 1924.

R.B.C. Hb. B.A.

10-27-24	5,410,000	95%	14	Feels well
11-18	4,370,000	85	7	" "
11-28	3,740,000	82	81	Abdominal cramps
12-17		83	60	Abdominal pain
1-2-25	4,290,000	75	63	Pain and weakness
1-15			32	Improving
2-27	4,710,000	89	6	Working, non-hazardous

In Case 4 a sudden rise of basophilic aggregations, with a corresponding drop in hemoglobin and red cell count, occurred at third examination, after an exposure of six weeks. A typical case of plumbism with abdominal cramps and obstipation existed at this time. As convalescence progressed, the basophilia gradually declined and the other findings slowly approached the normal.

By the application of these methods we have been able to markedly decrease the morbidity in the plant of the National Lead Battery Company, of St. Paul. With this regime in vogue, sixty-eight disability days resulted in a period of thirteen months and not a case of plumbism has developed in the past five months. In the previous year, under essentially the same plant conditions and with a slightly smaller number of exposed workers, there were seven hundred and twenty-seven disability days. Disability has thus been decreased 94 per cent.

CONCLUSIONS

1. The occurrence of lead poisoning can be markedly decreased by preventive measures.
2. These measures concern plant conditions and the health of workmen.
3. Frequent examinations of the blood of all exposed workers should be made to discover lead absorption.
4. The basophilic aggregation test, besides being of diagnostic value, has proved of great help

in estimating the degree to which absorption has taken place.

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"HEALTH AUDIT"—AID TO LONGER LIFE

In the past twenty-five years more has been accomplished in medicine than in all the centuries before. Scientific medicine has done about all it can for the mass diseases, now practically gone, but which used to frighten and destroy the people by tens of thousands.

In the fourteenth century fifty million people died of the plague. There was only one way of escaping it, and that was for people to leave their homes and run away to places free from it. In the eighteenth century many millions, probably one hundred millions, died of nothing but smallpox.

Today each man is dying his individual death, and it is up to us to see if we cannot reach him in some manner and persuade him that it is worth while, when he is still vigorous, to learn to keep his machinery from going to pieces from neglect.

In the sixteenth century, man had but twenty years of average life. It is fifty-eight today, and you wonder whether you will be able to reach the three score and ten of the Bible. We hope to be able to do that from a medical standpoint within the next twenty-five or forty years.

It is coming. We know it is coming. Our problem is advancing the age of our people by teaching men, women and children the art of keeping well. There are thousands of deaths annually, which, with reasonable precaution, could

be prevented. This means that society is not availing itself of the medical knowledge already at its disposal. Of the 3,000,000 people on the nation's sick list every day, one-fourth to one-third are needlessly so.

To combat this unnecessary suffering and waste of human resources, to induce better health and longer lives, a campaign of health education such as is now being undertaken by the Gorgas Memorial Institute is of the highest value.

An important phase of the work is the periodic health examination or health audit, the only known way of discovering certain incipient diseases before the individual realizes anything is wrong. In the beginning, Bright's disease, apoplexy, and high blood pressure are usually symptomless to their victim. But discovered in time by the health audit, the advice of the family doctor followed out, you are put on the road to recovery before your vital organs are wrecked beyond repair. Take as good care of your health as you would of your automobile and have your vital structures tested yearly to locate the enemy of your health.

A second vital function, which is truly preventive medicine, is teaching the individual the ill effects of wrong habits of living, which, if continued, will lead to illness. Improper eating, and getting insufficient exercise each day are among them.—By Charles H. Mayo, M.D., Rochester, Minn., Member Gorgas Memorial Institute.

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION,
SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN
MINNESOTA MEDICAL ASSOCIATION, AND MINNE-
APOLIS SURGICAL SOCIETY

Owned and Published by
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Under the Direction of Its

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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VIII SEPTEMBER, 1925 No. 9

EDITORIAL

The Inter-State Post Graduate Assembly

Minnesota is to be honored this year for the first time by a meeting of the Inter-State Post Graduate Assembly of America, which meets in St. Paul in October. This medical assembly began in 1916 as a district organization comprising the adjacent counties in three states, Illinois, Iowa and Wisconsin. Under the guiding hands of Dr. William B. Peck and the late Dr. Domer Smith, both of Freeport, Illinois, the organization has rapidly grown until it now comprises most of the States and Provinces of the United States and Canada.

The aim of the organization has always been a high one—to bring to the medical profession the truths of the science and art of medicine. To accomplish this object only recognized authorities, as a rule with university standing, have been invited to present their messages. Five days of a week each year are crowded with clinics and addresses, morning, afternoon and evening, and that this opportunity for intensive postgraduate study

has been appreciated by the busy practitioner has been evidenced by the rapidly increasing enrollment of the Assembly.

To assure proper membership only members of local, state, or provincial societies are eligible. The proceedings of the Assembly are published each year for those in attendance only.

This year the Assembly will be able to have its scientific program, registration and commercial exhibits all under the roof of the St. Paul municipal auditorium, which has a seating capacity of 4,000. The members of the profession comprising the St. Paul committees have perfected a working organization, and an abundance of clinical material which will be presented at the clinics is being collected by the committees in charge. The program appears elsewhere in this issue of MINNESOTA MEDICINE.

The Assembly this year promises to be the greatest in the history of the organization. Practically all the medical departments of the leading universities of the United States and Canada will be represented on the program by members of their teaching staffs. A number of foreign guests including the Rt. Hon. Lord Dawson of Penn, G.C.V.O., C.B., London; Sir William Arbuthnot Lane, Bt., London; Mr. William Blair Bell, F.R.C.S., Liverpool; Prof. Vittorio Putti, Bologna, Italy; Mr. Philip Franklin, F.R.C.S., London; Dr. H. L. McKisack, Belfast, Ireland; and Dr. W. H. Parkes, C.M.G., C.B.E., Auckland, New Zealand, are expected to be present and take part in the program.

The time of the officers of this Association, as well as that of the members of the St. Paul committees, is too valuable to be contributed to the furtherance of any object except one that is of great intrinsic value to the profession. This is a thousand times more true in regard to the time and talents of the distinguished teachers of medicine who are co-operating with us in our work. These services are gladly given that the physicians of North America may receive inspiration from the master minds of the medical profession, which will lead them to higher ambitions and greater achievements.

Much of the fascination derived from medical science comes from the handing on of new truths, whether they be new methods of operating, new ways of establishing diagnoses or new ways of

giving medication. There is no satisfaction in keeping acquired truths of any sort to oneself. Where the ultimate object is the alleviation of human ills there exists a double incentive and this is what brings the long list of eminent clinicians to this sort of a medical assembly each year. These services are gladly given that the physicians of North America may receive inspiration from the master minds of the medical profession which will lead to higher ambitions and greater achievements.

Advance in the Prevention and Treatment of Scarlet Fever

The story of the discovery by Dick and Dick¹ of the specific hemolytic streptococcus of scarlet fever and the progress in prevention and treatment of the disease described in recent literature leaves little room for doubt that the conquest of scarlet fever is assured.

Susceptibility to scarlet fever is determined by the Dick test. In persons thus shown to be susceptible *active immunity* is produced by the injection of the specific toxin. Although the length of the period of immunity thereby established has not been accurately proved, it is quite possible that a definite immunity can be produced which will last through the ages of greatest susceptibility. In order to indicate those cases in which immunity becomes lost it is absolutely essential to give Dick retests at intervals during childhood; just as vaccination for smallpox and the Schick test for diphtheria are repeated to insure permanent protection.

In persons exposed to scarlet fever *passive immunity* may be produced by means of an antitoxin. The use of scarlatinal antitoxin is a decided advance in the treatment of the disease. It may be used intravenously or intramuscularly. When the former method is used the toxic symptoms are usually rapidly relieved. In a majority of cases the temperature drops to normal in eight to twelve hours with a recurring rise dependent upon the degree of throat involvement. There is frequently a blanching of the rash in six to ten hours and headache, nausea, vomiting and general malaise are greatly lessened. The diminution of toxicity is invaluable to the patient in combating later sepsis. In this treatment it is imperative to guard against

serum reactions and the use of concentrated antitoxin is to be preferred.

The toxin for the susceptibility tests and for producing active immunity are both commercially available. The various antitoxins being produced will neutralize from one thousand to forty thousand skin test doses per cubic centimeter. The prophylactic and therapeutic doses vary in amount according to the concentration.

WOODARD COLBY.

Midwifery in Minnesota

Our attention has been called by the State Board of Health to a statement which appeared in a book by Dr. S. Josephine Baker (*Child Hygiene*, Harper and Brothers, 1925) that "Minnesota reports that over 75 per cent of its births are cared for by midwives," whereas records of the State Board show that only 6 per cent of births in Minnesota are now attended by midwives and this percentage has been on the decrease for several years.

A survey made in the summer of 1923 by the department of Child Hygiene of the State Board of Health shows the additional fact that of the 166 midwives tabulated outside of the three large cities in Minnesota the majority were elderly and foreign born and were not being replaced by younger material. The midwifery problem in Minnesota is therefore not a serious one and promises to solve itself.

The article by Dr. Adair which appears in this issue of MINNESOTA MEDICINE (page 586) throws additional light on the midwifery situation in one of the three large cities in Minnesota. He states that in Minneapolis the deliveries by midwives have diminished during the last ten years from 20 to 6 per cent. The condition in the cities is evidently following that in the country districts.

Of equal interest is the fact also brought out by Dr. Adair that the percentage of hospital deliveries in Minneapolis has increased during the past ten years from 25 to 70 per cent. The rest of the state would doubtless show a more or less corresponding increase. In the early days obstetrical cases were not segregated in hospitals as they now are, and, nursing technic being inferior, puerperal infection was more common. Women were doubtless better off when confined at home. With present day care the mother is safer in case of complications if in

1. Dick, G. F., and Dick, Gladys H. The etiology of scarlet fever. J. A. M. A., 82:301 (Jan. 26), 1924.

the hospital and this fact has come to be generally recognized by the public.

Hospitalization of obstetrical patients has been a godsend to obstetricians. The careful watching by a trained nurse relieves the attending physician of much uncertainty and anxiety. It has led on the other hand to one abuse which cannot be too severely condemned and that is the neglect of the laboring woman during the second stage of labor. Better than nine out of ten women will deliver themselves without the assistance of an attending physician. The main excuse for employing an obstetrician is in case an abnormal situation arises. The obstetrician who plans to dash to the bedside the last minute instead of watching for complications during the progress of labor does not earn his fee.

With the rapid disappearance of the midwife in Minnesota and the handling of most deliveries by physicians in hospitals, the profession will have it practically in their own hands to eliminate puerperal infection in our state. It is noteworthy in this respect that there have been during the past fifteen years in the neighborhood of a hundred deaths from puerperal infection yearly in Minnesota.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

INTER-STATE POSTGRADUATE ASSEMBLY OF AMERICA

The annual session of the Inter-State Postgraduate Assembly, formerly known as the Tri-State, will be held in St. Paul, October 12-16, inclusive. The scientific program, exhibits and registration will all be at the municipal auditorium with headquarters at the Saint Paul Hotel.

The officers of the Assembly are: Dr. Addison C. Page, Des Moines, Iowa, president; Dr. W. B. Peck, Freeport, Illinois, managing director; Dr. Edwin Henes, Jr., 445 Milwaukee Street, Milwaukee, Wisconsin, secretary and manager of exhibits. The meeting will be held under the auspices of the Ramsey County Medical Society, St. Paul, Dr. E. M. Hammes, president; Dr. C. L. Larsen, general chairman, and Dr. A. G. Schulze, general secretary. Hotel reservations may be made through Dr. George Earl, 1210 Lowry Bldg., St. Paul, chairman of the Hotel Committee, or by communicating with any hotel direct.

The scientific program will begin each morning at 7 A. M. and will occupy morning, afternoon and evening. Following the addresses Wednesday evening an informal entertainment will be offered by the Ramsey County Medical Society in conjunction with a reception in honor of Dr. A. C. Page, president of the Assembly. The banquet, which will be open to the public as well as to the members

and their ladies, will be held at the Saint Paul Hotel Friday evening. Addresses will be given by distinguished citizens from America and foreign countries.

The following unusual program will be offered:

PROGRAM

INTER-STATE POSTGRADUATE ASSEMBLY OF AMERICA

St. Paul

October 12, 13, 14, 15 and 16, 1925

FIRST DAY

MONDAY, OCTOBER 12

7 A. M.

1. Diagnostic Clinic (Medical). Diseases of the blood or heart cases. Dr. Charles S. Williamson, Professor of Medicine, University of Illinois.
2. Diagnostic Clinic (Surgical). Dr. William S. Baer, Associate Professor of Orthopedic Surgery, Johns Hopkins.
3. Diagnostic Clinic (Oto-laryngology). Dr. Hanau W. Loeb, Dean and Professor of Ear, Nose and Throat Diseases, St. Louis University.
4. Diagnostic Clinic (Surgical). Dr. E. Starr Judd, Professor of Surgery, Minnesota Graduate School of Medicine, Rochester, Minnesota.
5. Diagnostic Clinic (Surgical): (a) Non-specific lung suppuration; (b) Cancer of the esophagus, breast, thromboangiitis obliterans, cholecystitis. Dr. Willy Meyer, Prof. of Surgery, New York Post-Graduate School.

AFTERNOON SESSION

6. Diagnostic Clinic (Medical). Arterial hypertension, diseases of the heart and kidney. Dr. Elsworth S. Smith, Professor of Clinical Medicine, Washington University, St. Louis, Missouri.
7. Diagnostic Clinic (Surgical). Dr. Arthur M. Shipley, Professor of Surgery, University of Maryland.
8. Diagnostic Clinic (Surgical). Dr. George J. Heuer, Professor of Surgery, University of Cincinnati.
9. Diagnostic Clinic (Medical). Dr. William J. Kerr, Associate Professor of Medicine, University of California.
10. Chronic infections of the skull. Dr. Charles B. Lyman, Professor of Clinical Surgery, University of Colorado.
11. The management of the ordinary anemias. Dr. Charles S. Williamson, Professor of Medicine, University of Illinois.
12. Subject later. Dr. William S. Baer, Associate Professor of Orthopedic Surgery, Johns Hopkins.
13. Subject later. Dr. C. J. MacGuire, Jr., New York, N. Y.
14. The anatomic relation of the optic nerve to the paranasal sinuses. Dr. Hanau W. Loeb, Dean and Professor of Ear, Nose and Throat Diseases, St. Louis University, St. Louis.

EVENING SESSION

15. Pernicious anemia. Dr. Edward W. Montgomery, Professor of Medicine and Clinical Medicine, University of Manitoba, Winnipeg, Canada.
 16. The treatment of cicatricial contractures of the neck. Dr. Charles N. Dowd, Professor of Clinical Surgery, Columbia University.
 17. The diagnosis and treatment of heart disease. Dr. William J. Kerr, Associate Professor of Medicine, University of California.
 18. Subject later. Dr. E. Starr Judd, Professor of Surgery, Minnesota Graduate School, Rochester, Minnesota.
 19. Examination of para-nasal sinuses with clinical demonstrations and radiographs. Dr. Cornelius G. Coakley, Professor of Laryngology and Otology, Columbia University.
 20. Newer methods of preliminary medication and general anesthesia (slides). Dr. James T. Gwathmey, New York, N. Y.
 21. The preparation and use of thick skin grafts. Dr. Harry P. Ritchie, Associate Professor of Surgery, University of Minnesota, St. Paul.
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11. Observations on the gall-bladder. Dr. Frank Boland, Professor of Surgery, Emory University School of Medicine, Atlanta, Georgia.
 12. Thoracic suppurations. Dr. Arthur M. Shipley, Professor of Surgery, University of Maryland, Baltimore.
 13. Pyloric stenosis. Dr. E. E. Francis, Professor of Surgery, University of Tennessee, Memphis, Tennessee.

EVENING SESSION

14. The treatment of cardiac syphilis. Dr. Harlow Brooks, Professor of Clinical Medicine, University and Bellevue Hospital Medical College, New York, N. Y.
15. Plastic surgery. Dr. Allen B. Kanavel, Professor of Surgery, Northwestern University.
16. Heliotherapy as an adjunct in the treatment of chronic surgical conditions. Dr. George J. Heuer, Professor of Surgery, University of Cincinnati.
17. Further studies concerning the injurious effects of arterial hypertension on the cardio-vascular renal apparatus. Dr. Elsworth S. Smith, Professor of Clinical Medicine, Washington University, St. Louis.
18. The relation of the human constitution to disease. Dr. George Draper, New York, N. Y.
19. Subject later. Dr. Milton J. Rosenau, Professor of Preventive Medicine and Hygiene, Brookline, Boston.
20. Drainage as a factor in renal disease. Dr. Guy L. Hunner, Associate Professor of Gynecology, Johns Hopkins.

SECOND DAY

TUESDAY, OCTOBER 13

7 A. M.

1. Diagnostic Clinic (Laryngology). Dr. Cornelius G. Coakley, Professor of Laryngology and Otology, Columbia University.
2. Diagnostic Clinic (Surgical). Neck cases, especially tuberculosis, bronchial cysts or fistulae, thyroglossal cysts, or fistulae hygromas. Dr. Charles N. Dowd, Professor of Clinical Surgery, Columbia University.
3. Diagnostic Clinic (Medical). Bone, cardio-vascular, blood or gastro-intestinal cases. Dr. Joseph Sailer, Professor of Clinical Medicine, University of Pennsylvania.
4. Diagnostic Clinic (Surgical). Cranial and general surgical cases. Dr. Samuel Clark Harvey, Associate Professor of Surgery, Yale University.
5. Diagnostic Clinic (Surgical). Upper abdominal cases. Dr. John B. Deaver, Professor of Surgery, University of Pennsylvania.

AFTERNOON SESSION

6. Diagnostic Clinic (Diabetic). Dr. Rollin T. Woodyatt, Clinical Professor of Medicine, Rush Medical College.
7. Diagnostic Clinic (Surgical). Surgery of the face and various parts of the body. Dr. Allen B. Kanavel, Professor of Surgery, Northwestern University.
8. Diagnostic Clinic (Medical). Heart and lung cases. Dr. Edward J. Beardsley, Associate Professor of Medicine, Jefferson Medical College.
9. The rôle of operative surgery in the treatment of pulmonary tuberculosis. Dr. Willy Meyer, Professor of Surgery, New York Post-Graduate School.
10. Hypertension. Dr. James H. Means, Professor of Clinical Medicine, Harvard.

THIRD DAY

WEDNESDAY, OCTOBER 14

7 A. M.

1. Diagnostic Clinic (Medical). Cases of cardiac syphilis, cardiac decompensation, lung tumor or abscess, acute rheumatic fever, angina pectoris, chronic nephritis. Dr. Harlow Brooks, Professor of Clinical Medicine, University and Bellevue Hospital Medical College, New York.
2. Diagnostic Clinic (Gynecology). Dr. Guy L. Hunner, Associate Professor of Gynecology, Johns Hopkins.
3. Diagnostic Clinic (Psychiatry). Dr. Thomas W. Salmon, Professor of Psychiatry, Columbia University.
4. Diagnostic Clinic (Medical). Hypertensive diseases. Dr. James H. Means, Professor of Clinical Medicine, Harvard University.
5. Diagnostic Clinic (Surgical). Cases of rheumatism or rheumatoid arthritis. Dr. Charles H. Mayo, Mayo Clinic, Rochester, Minnesota.

AFTERNOON SESSION

6. Pathological conference supervised by Dr. H. E. Robertson, Professor of Pathology, University of Minnesota (Mayo Foundation), Rochester, Minn.
7. Diagnostic Clinic (Medical). Cardio-vascular diseases or diseases of the blood. Dr. Maurice C. Pincoffs, Professor of Medicine, University of Maryland.
8. Familiar problems in gynecology. Dr. William P. Graves, Professor of Gynecology, Harvard University.

9. Diphtheria and its after-effects. Dr. H. B. Cushing, Clinical Professor of Pediatrics, McGill University.
10. Duodenal ulcer versus cholecystitis. Dr. John B. Deaver, Professor of Surgery, University of Pennsylvania.
11. Some recent revelations of the denervated heart. Dr. Walter B. Cannon, Professor of Physiology, Harvard University.
12. The significance of arterial hypertension. Dr. Wilder Tileston, Clinical Professor of Medicine, Yale University.
13. Carcinoma of the rectum. Dr. Alfred T. Basin, Professor of Surgery, McGill University.

EVENING SESSION

14. The diagnosis of abdominal tumors. Dr. Joseph Sailer, Professor of Clinical Medicine, University of Pennsylvania.
15. The liver and its function in relation to its surgical diseases. Dr. Samuel Clark Harvey, Associate Professor of Surgery, Yale University.
16. Renal and ureteral stones. Dr. Edward L. Keyes, Professor of Clinical Surgery, Cornell University.
17. Post-graduate instruction in our own offices. Dr. Edward J. Beardsley, Associate Professor of Medicine, Jefferson Medical College.
18. Osteotomy of the os calcis for extreme cases of flat feet. Dr. John P. Lord, Professor of Orthopedic Surgery, University of Nebraska, Omaha, Nebr.
19. Treatment and prognosis in pericarditis. Dr. Maurice C. Pincoffs, Professor of Medicine, University of Maryland.
20. Modern medical education—Progress or retrogression. Dr. Eugene E. Murphey, Professor of Medicine, University of Georgia, Augusta, Georgia.

FOURTH DAY

THURSDAY, OCTOBER 15

7 A. M.

1. Diagnostic Clinic (Surgical). Renal and ureteral stone cases. Dr. Edward L. Keyes, Professor of Clinical Surgery, Cornell University.
2. Diagnostic Clinic (Pediatric). Rheumatic fever and after-effects in children of school age. Dr. H. B. Cushing, Clinical Professor of Pediatrics, McGill University.
3. Diagnostic Clinic (Surgical). Acute abdominal lesion cases. Dr. Alfred T. Bazin, Professor of Surgery, McGill University.
4. Diagnostic Clinic (Surgical). Dr. Arthur Dean Bevan, Professor of Surgery, Rush Medical College.
5. The five most important obstetrical mistakes. Dr. Joseph B. DeLee, Professor of Obstetrics, Northwestern University.

AFTERNOON SESSION

6. Diagnostic Clinic (Medical). Abdominal diseases, especially liver. Dr. Wilder Tileston, Clinical Professor of Medicine, Yale University.

7. Diagnostic Clinic (Surgical). Management of cases of prostatic obstruction. Dr. Hugh Cabot, Professor of Surgery, University of Michigan.
8. Pneumococcal peritonitis. Dr. Charles L. Gibson, Professor of Surgery, Cornell University.
9. Focal infection. Dr. Charles H. Mayo, Mayo Clinic, Rochester, Minnesota.
10. The etiology of anemia and its importance in diagnosis and treatment. Dr. Duncan A. L. Graham, Professor of Medicine, University of Toronto.
11. A re-study of operations for radical cure of hernia. Dr. Arthur Dean Bevan, Professor of Surgery, Rush Medical College.
12. Subject later. Mr. Philip Franklin, F.R.C.S., London, England.
13. Subject later. Dr. Thomas W. Salmon, Professor of Psychiatry, Columbia University.

EVENING SESSION

14. The relative rôles of surgery and of radiation in the treatment of tumors of the breast. (a) Dr. F. E. Bunts, Professor Principles of Surgery, Western Reserve University, Cleveland, Ohio. (b) Dr. U. V. Portmann, Cleveland Clinic, Cleveland, Ohio.
15. Joint ankylosis—Surgical measures for its prevention and relief. Dr. Nathaniel Allison, Professor of Orthopedic Surgery, Harvard University.
16. The physiology of the female pelvic floor. Dr. Ernest F. Tucker, Professor of Gynecology, University of Oregon, Portland, Oregon.
17. Syphilis and its relation to eye diseases. Dr. William H. Wilder, Professor of Ophthalmology, Rush Medical College.
18. Diagnosis of diseases of the rectum. Dr. L. J. Austin, Professor of Surgery, Queen's University, Kingston, Canada.
19. Subject later. Dr. James E. Thompson, Professor of Surgery, University of Texas, Galveston, Texas.
20. Subject later. Dr. Arthur A. Law, Associate Professor of Surgery, University of Minnesota Graduate School of Medicine, Minneapolis, Minn.

FIFTH DAY

FRIDAY, OCTOBER 16

7 A. M.

1. Diagnostic Clinic (Surgical). Abdominal and gastrointestinal cases. Dr. Charles L. Gibson, Professor of Surgery, Cornell University.
2. Diagnostic Clinic (Surgical). Joint involvement, particularly cases of suspected tuberculosis of either the knee, hip or other joints. Dr. Nathaniel Allison, Professor of Orthopedic Surgery, Harvard University.
3. Diagnostic Clinic (Medical). Cases of cardiac lesions or signs of interference with cardiac function. Dr. J. C. Meakins, Professor of Medicine and Director of the Department, McGill University.
4. Diagnostic Clinic (Surgical). Dr. George W. Crile, Professor of Surgery, Western Reserve University, Cleveland, Ohio.

5. Diagnostic Clinic (Medical). Cases of anemia and mediastinal tumor. Dr. Duncan A. L. Graham, Professor of Medicine, University of Toronto.

AFTERNOON SESSION

6. Diagnostic Clinic (Surgical). Cases of anemia. Dr. William J. Mayo, Mayo Clinic, Rochester, Minnesota.
7. Diagnostic Clinic (Surgical). Sir William Arbuthnot Lane, Bt., London, England.
8. Pathological Conference supervised by Dr. H. E. Robertson, Professor of Pathology, University of Minnesota (Mayo Foundation), Rochester, Minnesota.
9. Circulatory failure in heart disease. Dr. J. C. Meakins, Professor of Medicine, McGill University.
10. The cause and prevention of so-called catheter cystitis and retention of the urine. Dr. Hugh Cabot, Professor of Surgery, University of Michigan.
11. The treatment of gastric ulcer. (a) Indications for and the technique of dissection of the stomach for ulcer. Dr. George W. Crile, Professor of Surgery, Western Reserve University, Cleveland, Ohio. (b) The medical treatment of peptic ulcer. Dr. John Phillips, Assistant Professor of Therapeutics, Western Reserve University, Cleveland, Ohio. (c) The patient versus his lesion. Dr. George W. Crile, Cleveland, Ohio.
12. The association of lesions of the bone marrow, the liver and the spleen in certain blood dyscrasias. Dr. William J. Mayo, Mayo Clinic, Rochester, Minnesota.

FOREIGN GUESTS

- Sir William Arbuthnot Lane, London, England.
 Mr. William Blair Bell, F.R.C.S., Professor of Obstetrics and Gynecology, University of Liverpool Medical Department, Liverpool, England.
 Professor Vittorio Putti, Bologna, Italy.
 Mr. Philip Franklin, F.R.C.S., London, England.
 Dr. H. L. McKisack, Consulting Physician, Royal Victoria Hospital, Belfast, Ireland.
 Dr. W. N. Parks, C.M.G., C.B.E., Auckland, New Zealand.
 Rt. Hon. Lord Dawson of Penn, London, England.

GREAT NORTHERN RAILWAY SURGEONS ASSOCIATION

At the annual meeting of the Great Northern Railway Surgeons Association held in Glacier National Park, June 25 and 26, 1925, the following officers were elected for the coming year: President, Dr. R. M. Simpson, Winnipeg; first vice-president, Dr. J. A. DuBois, Sauk Center, Minn.; second vice-president, Dr. C. B. Lewis, St. Cloud, Minn.; third vice-president, Dr. H. J. Knott, Seattle, and secretary-treasurer, Dr. R. C. Webb, Minneapolis.

Among those who appeared on the program were the following surgeons from Minnesota: Dr. Frank Burch, St. Paul, "Injuries to the eyes"; Dr. C. H. Patterson, Barnesville, "Tetanus, with report of a case"; Dr. E. M. Hammes, St. Paul, "The neurological examination in rail-

road injuries"; Dr. T. A. Peppard, Minneapolis, "The relation of hypertension to retirement"; Dr. C. I. Oliver, Graceville, "Surgical judgment, its relation to prognosis and mortality in railroad injuries"; Dr. H. W. Froehlich, Thief River Falls, "Site of amputation best adapted for artificial limbs"; Dr. H. J. Thornby, Moorhead, "Role of the surgeon at a railroad wreck"; Dr. R. G. Allison, Minneapolis, "The differential diagnosis of spinal conditions"; Dr. B. S. Adams, Hibbing, "Fractures of the patella."

The registration at the 1925 meeting showed an attendance of 100 out of a membership of 277. It was voted to hold the next meeting in Winnipeg in June, 1926.

PHYSIOTHERAPEUTIC CONVENTION

Physicians are invited to attend the Fourth Annual Physiotherapeutic Convention to be held at the Drake Hotel, Chicago, October 12 to 16, 1925. Papers will be read and discussed by leading physicians of national and international reputation in this field.

Demonstrations and exhibits of the latest apparatus and methods employed in physiotherapy will be given. Physicians who are in good standing in their State Medical Association and who can give evidence of the fact are invited. Reservations may be made and programs obtained by addressing the Educational Department of H. C. Fischer & Co., 2335 Wabansia Ave., Chicago, Illinois.

OF GENERAL INTEREST

Dr. C. G. Nordin, formerly of the Brainerd Clinic, Brainerd, is now located in St. Paul.

Dr. Robinson Bosworth of St. Paul has become associated with the Rockford Sanatorium, Rockford, Illinois.

Dr. Herman J. Kooiker, formerly of Hills, Minn., has moved to North Albert Lea, where he is practicing his profession.

Dr. William G. Crandall has moved from Graceville, Minn., to Watertown, S. D., where he is associated with the Barton Clinic.

Dr. J. W. Daniels and family of St. Peter spent the latter part of August on a vacation trip by motor to Duluth and Northern Minnesota.

Dr. R. L. Kirsch is visiting at Crookston, where he formerly practiced. He is making preparations to remove permanently to Pasadena, California, where he spent the winter.

Dr. L. G. Guyer, formerly a member of the staff of Nopeming Sanatorium, Nopeming, has become associated with the Department of Public Institutions, Tuberculosis Division, in St. Paul.

Dr. Merton Field of Northfield is now located in Chipewaga Falls, Wisconsin, where he is specializing in the treatment of eye, ear, nose and throat diseases. Dr. Field has taken over the practice of Dr. C. J. Nedry.

Dr. George T. Baskett, Assistant Superintendent of the St. Peter State Hospital for the past 13 years, has been

promoted to the Superintendency of the Willmar State Asylum and will assume his new duties on October 1.

Will members of the Association having in their possession copies of the Transactions of the Minnesota State Medical Association for the years 1876 and 1887 kindly communicate with the office of MINNESOTA MEDICINE, 402 Guardian Life Bldg., St. Paul, Minn.

The Bethesda Hospital at Crookston is taking the necessary steps to be placed upon the accredited list of the American College of Surgeons. At the recent staff organization, Dr. M. O. Oppegaard was elected president; Dr. G. A. Morley, vice president, and Dr. W. H. Hollands, secretary.

Dr. R. M. Phelps, Superintendent of the St. Peter State Hospital for the past 13 years, has resigned on account of ill health and will leave the service on October 1. Dr. Phelps has been in the state service for the last 40 years. Dr. George H. Freeman, Superintendent of the Willmar State Asylum, has been appointed Superintendent of the St. Peter State Hospital, effective October 1.

Dr. G. R. Kamman, St. Paul, sailed August 22, for London, where he will spend three months in postgraduate study specializing in neurology and psychiatry. From London Dr. Kamman will go to Vienna and Munich. On his return he will visit several clinics in the East before resuming his practice in association with Dr. E. M. Hammes in St. Paul. Dr. Kamman expects to return within a year.

Dr. L. L. Brown, who has practiced for the past five years at Crookston, has become associated with the Northwestern Clinic at that place. The Clinic occupies its own fully equipped building with the medical staff consisting of Dr. M. O. Oppegaard, General Surgery; Dr. O. E. Locken, General Medicine; Dr. C. L. Oppegaard, Eye, Ear, Nose and Throat; Dr. L. L. Brown, Pediatrics, and Dr. C. D. Mitchell, Dentistry.

Dr. J. A. Evert, who has been associated as assistant chief surgeon in the Northern Pacific Hospital in St. Paul for several years, has been appointed chief surgeon in charge of the Northern Pacific Hospital at Glendive, Montana, where he will assume his duties October 1. Dr. A. W. Ide will remain in charge of the hospital in St. Paul with Dr. B. I. Derauf as surgical assistant and Dr. M. A. Shillington as assistant to the chief surgeon.

The fall meeting of the Nicollet-Le Sueur County Medical Society will be held at the St. Peter State Hospital on September 3. The scientific program will be given over to a lecture, with moving pictures and slides, on Late Technic in Physiotherapy Methods.

There is a move on foot to erect a city hospital in St. Peter. The matter is now being considered by the Business Men's Association of St. Peter. This is a very commendable move by this progressive association, as the need for such a hospital is urgent.

ERRATUM

An error was made in last month's issue relative to the present location of Dr. I. E. Bowing, formerly of St. Cloud. Dr. Bowing is at present taking a three months' postgraduate course in Chicago.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

EPIDERMOID CYST WITH PRESSURE ATROPHY OF THE ADJACENT BONE: REPORT OF CASE

FREDERICK CHRISTOPHER, M.D., F.A.C.S.

Junior Surgeon, Evanston Hospital
Evanston, Ill.

Epidermoid cysts are those having simple epidermal linings and are distinguished from dermoid cysts by the absence of definite dermal structures. They may be congenital in origin but are usually caused by a traumatism which has caused the misplacement of fragments of epidermis. This occurs most frequently on the exposed surfaces such as the palms and soles, according to Ewing.¹ They have been produced experimentally. They attracted the interest of Reverdin² in 1887, and in 1888 Jonnesco² termed them "kyste epidermique traumatique."

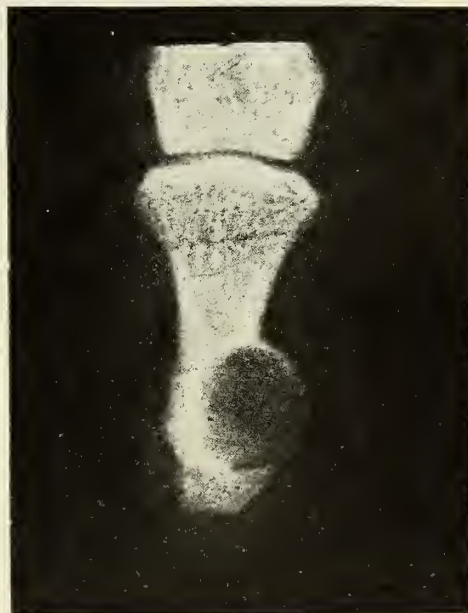


Fig. 1.

Patient M. L. T. was first seen in June, 1925. She complained of a firm, slightly tender area, on the palmar surface of the distal phalanx of the left middle finger just beyond the articulation. She stated that thirty-two years previously she had closed a heavy door on the finger, injuring it so severely that it was nearly taken off. Three years

after this time she again caught the finger in a door, injuring it less severely, however. Some five years after this trauma she ran a sewing machine needle through the same finger and lost the nail for the third time.

The finger was submitted to x-ray examination (Fig. 1) and the following report was made by Dr. Jenkinson: "There is a definite area of bone destruction involving the distal phalanx of the middle finger of the left hand. This area seems to be cystic. It is fairly well incorporated."

On June 10, 1925, at the Evanston Hospital, the patient was operated upon under general anesthesia. Through a lateral incision the cyst was readily removed. After the removal of the cyst, the surface of the distal phalanx presented a very smooth rounded hollow. The wound healed cleanly.



Fig. 2.

Report of the pathologist (Dr. J. L. Williams): "About 1 c.c. of gray-white granular material and partially necrotic substance containing a piece of firm tissue also partially necrotic, 1.2x1x0.4 cm. Microscopic: This tissue consists of the wall of a cyst, lined with several layers of squamous epithelium covered with cornified and necrotic epithelium such as is seen in an epidermoid cyst. Immediately surrounding the epithelial lining is a layer of fibrous tissue containing small islands of bone and cartilage. Diagnosis: Epidermoid cyst with pressure atrophy of the adjacent bone." (Fig. 2.)

BIBLIOGRAPHY

1. Ewing, James: *Neoplastic Diseases*. 1919, p. 941.
2. Reverdin: *Rev. Med. Suisse Dom.* 1887, pp. 7, 121.
3. Jonnesco: *Bull. Soc. d'Anat.* 1888, p. 940.

MELANOSARCOMA OF THE CHOROID*

REPORT OF CASE

V. J. SCHWARTZ, M.D.

Minneapolis

L. R., a man, aged 20, white, unmarried, was admitted to the General Hospital January 9, 1925, with severe pain in the right eye, of three weeks' duration. He stated that vision in this eye had been impaired for a long time, but that about a year ago it became rapidly worse so that for almost a year this eye had been functionless.

The family history was negative and, with the exception of the following, the patient's personal history was negative.

Seven years before he had been struck in this eye with a swiftly thrown baseball and had considerable trouble in the eye afterward, although he had some vision, he said. About a week before admission to the hospital the eye became painful and reddened. When seen by us he had marked ciliary and conjunctival injection and the pupil was dilated. Purkinje-Sanson images were present. The eye felt very hard, and the McLean tonometer, which registers a normal tension as being between 25 and 40, showed a tension in the good eye of 35, whereas in the affected eye the tension was 120. In other words, an absolute glaucoma existed.

A very disturbing condition was the fact that the fundus was not to be seen. The lens was subluxated, its upper margin being faintly visible, but the interior of the eye was not to be made out.

Because of the clear history of traumatism it was thought that there might be an old, with possibly a fresh, intraocular hemorrhage, despite the fact that the old clot, which would have organized long ago, would probably have produced a retinal detachment and so, likely, a diminished tension. However, a recent hemorrhage or a transudate might easily elevate this again. The possibility of intraocular tumor was also suggested, but under the circumstances this could not be investigated. Transillumination was not conclusive. The patient was suffering greatly, so an iridectomy was done, after having first made a subconjunctival injection of adrenalin as recently recommended, unfortunately without decreasing the tension appreciably in this case.

The patient felt better for a few days, the tension having dropped to about 45; but this soon began to rise again and the pain returned just as before. More than that, some discomfort and lacrimation appeared in the left or good eye, so it was determined to enucleate at once.

This was done and on section of the eyeball a melanotic sarcoma of the choroid was found, somewhat less than a centimeter in diameter and rather near the equator. There was a widespread detachment of the retina, it being pushed up hard against the iris and lens. Beneath it, and filling the greater part of the eyeball, was a mass of serum, the vitreous humor having been absorbed. These findings explained at once our inability to see the interior of the eyeball with the ophthalmoscope.

It might be well to recall that sarcoma of the choroid at this early age is very rare.

*From the Eye, Ear, Nose and Throat Service, Dr. F. J. Pratt, Chief, Minneapolis General Hospital.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH

THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

TUBERCULOUS ENTERITIS—THE DIETETIC MANAGEMENT: Gerald B. Webb, M.D., and G. Burton Gilbert, M.D., Colorado Springs (Transactions of the Twentieth Annual Meeting National Tuberculosis Association, pp. 121-125). Tuberculous enteritis may occur in moderately advanced and even relatively early pulmonary cases. A slight persistent nausea, anorexia, a feeling of discomfort after eating, undue nervousness, constipation and gaseous digestion should suggest a beginning tuberculous enteritis. Such a patient may lose ground although lung condition is improving. If there is looseness of the bowels alternating with constipation or slight crampy pains in the abdomen, we look for tuberculous enteritis. Autopsies have shown that extensive ulceration may exist without any diarrhea, but with a very persistent constipation.

The results of abdominal examination are very indefinite in early cases. There may be absence of superficial abdominal reflexes in the right lower quadrant. Examination of the stools is of little value. The x-ray has been of great value in diagnosing early cases. Both a test meal and an enema should be given. The diagnosis can be made by noting hypermotility, filling defects and spastic phenomena. Ulcers occur in the ileum oftener than they do in the colon. X-ray examination is not always necessary—it may be hard on the patient. Dietetic management of the digestive disorders should be begun when one is even suspicious of this complication.

Surgery has not accomplished much in these cases; the disease is frequently found at operation to be more extensive than previously suspected.

The patient should be put at rest and the work of the intestines reduced to a minimum. Exercise increases peristalsis. A patient at rest can gain weight on a relatively low caloric diet. Milk requires the least expenditure of digested energy. It should be taken often in small doses, three or four ounces every waking hour. It can be modified by the addition of citrate, lime water, or be started with teaspoonful doses. Should there be no increase in weight 1 ounce of cream can be added to 3 ounces of milk. This also helps constipation if it exists.

Mineral oil may be added for constipation. Later, after a few days, patients can be allowed to take three or four small meals daily instead of hourly feedings. The meals should not exceed six ounces. If diarrhea persists and patient is in good general condition, a complete fast of a day or two is valuable. If milk cannot be borne, proteins in small amounts may be given. One must eliminate fruits and coarse foods from the diet. Rest must be long continued. Complete relief generally comes very slowly. Small meals will trickle past an ulceration whereas large meals cause a distinct disturbance.

Little medication is necessary. Application of moist heat to the abdomen is of some value in painful cases. Opium is reserved for extreme cases. Heliotherapy is worthy of an extended trial unless there is too much prostration. Sun and the ultra-violet radiations of quartz lamps are used in some cases. Good results can be obtained by dietetic management. Calcium chloride given intravenously temporarily decreases diarrhea in some cases.

WM. BAILEY, M.D.

PHYSICAL FACTORS INFLUENCING LONGEVITY IN THE TUBERCULOUS: J. Burns Amberson, Jr., M.D. (Journal of the Outdoor Life, 1925, xxii, 425). Prognosis in a chronic disease like tuberculosis is difficult. There is always a variation from the usual type which may have an important bearing. Small lesions in the lung are healable in over 90 per cent of cases. The outlook is more favorable if the disease is in the upper part of the lung. In some early cases it can soon be determined that the disease is of a rapidly progressive type and that some special treatment like pneumothorax is indicated. Minimal or early cases that immediately demand radical operative treatment are, however, rare. The prospect of recovery diminishes as the disease in the lung progresses, but the resulting disadvantage is often offset by prolonging the treatment. Complications are more common in the cases of longer duration, but are not necessarily incurable. If the lungs improve under proper treatment the complication is likely to also improve. The fundamental principles of treatment, hygienic living with systematic rest, sunshine, fresh air and suitable food are the foundations of effective treatment in the case of all of the complications. Special throat treatments without these measures are not likely to cure tuberculous laryngitis. Complete rest of the voice. Silence treatment is one of the most effective local measures.

Intestinal tuberculosis, if not too extensive, may heal under rest treatment together with a bland diet. In some cases artificial or natural heliotherapy or x-ray treatment may be an added help. Operations are rarely helpful. X-ray studies have shown that this complication may now be detected much earlier than formerly. Pleurisy is usually merely an incident in the course of pulmonary tuberculosis which does not alter the course of the disease. Empyema, while always serious, may run a relatively benign course. Tuberculous peritonitis may heal under ordinary rest aided by heliotherapy. Tuberculosis of the middle ear usually results in perforation of the ear drum, some loss of hearing and a variable chronic discharge containing

tubercle bacilli. This is as a rule the extent of the damage. The prognosis of joint tuberculosis is usually good under general bodily rest with rest of the diseased part. Casts and various mechanical contrivances are often helpful. Heliotherapy is especially valuable.

In conclusion, the author states that complications are to be treated each according to its peculiar nature, but not to the exclusion and neglect of the pulmonary disease. In all cases a scheme of general treatment, systematic "taking of the cure," should be used.

A. T. LAIRD, M.D.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

UNRESOLVED PNEUMONIA IN CHILDREN: By Gerard N. Krost, M.D. (Amer. Jour. Diseases of Children, July, 1925). Pneumonia in babies and children, whether of a pure lobar type or bronchopneumonia, has a distinct tendency to be prolonged. The temperature of babies with lobar pneumonia often drops by lysis, and it is exceptional to have fever present at the end of two weeks. The author has arbitrarily fixed three weeks of abnormal temperature and persistence of consolidation as constituting a case of unresolved lobar pneumonia. The author has therefore arbitrarily chosen four weeks of fever and signs of consolidation as criteria in defining a case of bronchopneumonia as unresolved.

The temperature, which has been high in the acute stage, becomes lower, but the lungs often show larger and larger areas of consolidation; there is a progressive loss of weight and appetite, and often the patient succumbs after eight or ten weeks' illness. If recovery takes place, there is a slow convalescence and frequent relapses.

A Pirquet or intradermal tuberculin test should always be made. In none of the patients in this report was the Pirquet test positive, nor was the progress later indicative of tuberculosis in any of them.

Are there any serious objections to the use of the roentgen-ray treatment, and what is its probable action? Small doses were found to increase immunity in mice by stimulating lymphocytosis. Large doses caused leukocytic destruction. If leukocytic destruction occurs, then one of the body defenses would be destroyed and the condition become worse. It would seem more logical to assume that the small doses of roentgen-ray penetrating the lung tissue acted as a stimulant to phagocytosis. It would also seem logical to use relatively small doses.

The dose given by Blumenthal was 5 milliamperes, spark gap $7\frac{1}{2}$ inches, distance 8 inches, filter through 3 millimeters of aluminum and 4 of sole leather, the time being five minutes. The exposure was made posteriorly over the area

of greatest consolidation, found clinically and by localization by means of roentgenograms. In only two cases was a second treatment given, in one within ten days, and in another within two weeks. The author felt that the effect of the first treatment had not ceased up to that time.

In twelve cases of unresolved pneumonia treated by roentgen-ray there was apparent benefit in eleven.

There seemingly was fever and constitutional reaction in three cases. This was temporary and probably beneficial.

There is no evidence of any harm in the use of the roentgen-ray in the dosage given.

R. N. ANDREWS, M.D.

LACTIC ACID MILK IN THE FEEDING OF PRE-MATURE CHILDREN: By Morris Gleich, M.D. (Archives of Pediatrics, July, 1925). In the absence of breast milk, the author suggests lactic acid milk in the feeding of premature infants. This acid food has a high caloric value, is concentrated, favors gastric as well as intestinal digestion, and is inimical to the presence and growth of pathogenic micro-organisms. Such qualities make it an ideal food for premature children.

The success of lactic acid milk probably lies in its acidity and low buffer value, both being favorable to fat digestion and calcium absorption. Begin with one-half ounce skimmed lactic acid milk every two hours, ten feedings a day, and proceed as soon as feasible to one-half ounce lactic acid milk every two hours, ten feedings in twenty-four hours. Most thriving premature infants soon take two to three ounces lactic acid milk every three hours, seven feedings in twenty-four hours.

All prematures are fed cod liver oil after the second week. Beginning with one drop in each bottle of milk and one drop in the orange juice (which is given at the time of cod liver oil) increase the amount till the infant receives one to two teaspoons a day. Hospitalization of premature children should be discouraged. Better results will be obtained when they are discharged as soon as possible and placed in the hands of a competent nurse or intelligent mother. This reduces the danger of infection to a minimum.

R. N. ANDREWS, M.D.

INSULIN IN THE TREATMENT OF MALNOURISHED INFANTS: By Frederick F. Tisdall, M. D., Alan Brown, M.B., T. G. H. Drake, M.B., and M. G. Cody, M.B. (Amer. Jour. of Diseases of Children, July, 1925). The effect of the administration of insulin to malnourished infants has been studied. Nine infants received insulin in conjunction with the intravenous injection of 20 per cent glucose. Seven infants, over a total of thirteen periods, received insulin in conjunction with 15 per cent glucose subcutaneously and six infants in conjunction with the feeding.

A definite increase in the weight was obtained in 50 per cent of the cases. In these cases in many instances, however, other factors were present which lessened the probability that insulin was the cause of the increase in weight.

The intravenous injection of 20 per cent glucose and insulin together is probably not the most efficient method of administration.

Insulin apparently produces the most marked diminution in the elevation of the blood sugar when administered about one and one-half hours before the glucose.

The effect of insulin on the blood sugar concentration varies tremendously in different infants, consequently its administration is not without danger.

R. N. ANDREWS, M.D.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:

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THE TREATMENT OF GENERAL PERITONITIS:

George E. Armstrong (Surgery, Gynecology, and Obstetrics, 1925, xl, 760). Organisms causing peritonitis are so adherent to the peritoneal surfaces that no amount of washing, sponging, nor rubbing can remove them. They can be destroyed only by the toxins that they themselves create. Death of the germ is assured, given sufficient time.

To leave an abdomen full of pus requires courage; however, the justification for doing so is the result. If coils of intestines are undisturbed, adhesions will not form and there will be no mechanical obstruction. The technique should be to deal with the cause of infection gently. Fowler position, saline by rectum or intravenously, and withholding of food until the bowels move, are recommended. In draining the pelvis a tube is introduced primarily to relieve intra-abdominal tension and thus facilitate the circulation through the blood and lymph vessels. This treatment will usually lead the patient to recovery if introduced before paralytic obstruction has developed.

J. K. HOLLOWAY, M.D.

SUPRACERVICAL HYSTERECTOMY WITH CONSERVATION OF THE MENSTRUAL FUNCTION: Emil Novak, M.D. (Surgery, Gynecology, and Obstetrics, 1925, xl, 874-875). The psychological effect of destroying the menstrual function is great in a large percentage of patients. Moreover, there is evidence to indicate that the life of conserved ovaries is much prolonged by retention of a portion of the uterus.

A type of menstrual function will remain if a small portion of the uterus is conserved. By amputating the uterus at a higher level than the internal os the menstrual function can be conserved with no possible harm and probably great benefit to the patient. If too large a stump is left difficulty may be experienced in utilizing the anterior bladder peritoneum to cover the line of suture, and there is a possibility of postoperative bladder irritability.

There are many indications for this conservative type of operation, notably cases of uterine myoma and chronic

pelvic inflammatory disease in young women where preservation of the menstrual function seems desirable.

J. K. HOLLOWAY, M.D.

RADIOGRAPHIC EVIDENCE OF THE ASSOCIATION OF URETERAL STRICTURE AND URINARY CALCULI: Guy L. Hunner, M.D. (Journal of Urology, 1925, xiii, 497-523). The presence of a calculus in the kidney or ureter is presumptive evidence of a coexistent ureteral stricture. Ureteral stricture is probably of blood-borne origin; hence it is probably always bilateral. Many symptoms formerly attributed to stones may result from stasis due to stricture. Silent stones, reno-renal reflex, calculous anuria with stone obstruction on one side only, bilateral stones, frequency of recurrence of stone on the side operated upon, recurrence of symptoms after the stone has passed, persistence of a sinus after operation, the phenomenon of migrating stones, et cetera, can be explained largely upon a basis of ureteral strictures.

Early treatment by dilatation institutes drainage, relieves stasis, prevents infection. Ureteral stricture is an associated lesion in most cases of calculus in the upper urinary tract. The author believes that the renal catheter with a wax bulb is the simplest, most efficient, and most accurate method for diagnosis, study and treatment of ureteral stricture. Thirteen case reports are submitted, well illustrated by roentgen-ray cuts.

J. K. HOLLOWAY, M.D.

ROENTGENOLOGY

SUPERVISORS:

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MPLS. GEN'L HOSPITAL, MINNEAPOLIS

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MAYO CLINIC, ROCHESTER

ORAL ADMINISTRATION OF SODIUM TETRABROMPHENOLPHTHALEIN—PRELIMINARY REPORT: Menes and Robinson (Am. Jour. Roent., xiii, 369, April, 1925). The oral administration of this dye has been successful in most cases, producing a distinct gall-bladder shadow. It is superior to the intravenous method because it gives less discomfort, there is no danger of sloughing, it is easier to give, and the danger is minimal. The dye reaches the systemic circulation in very small quantities so does not cause severe reactions. The chief disadvantage of this method lies in the fact that some patients are unable to retain the dye, becoming nauseated, especially if a full meal is not taken with it. In addition, it is impossible to obtain an accurate record of the filling and emptying of the gall-bladder.

Films are taken at 12, 18, and 24 hours after administration. Ingestion of food causes rapid emptying of the gall bladder. Diagnosis depends essentially on the same factors as in the intravenous method.

LEO G. RIGLER, M.D.

THE PRESENT STATUS OF THE ROENTGEN TREATMENT OF PURPURA HEMORRHAGICA BY IRRADIATION OF THE SPLEEN: Pancoast, Prendergrass, and Fitz-Hugh (*Am. Jour. Roent.*, v. 13, p. 558, June, 1925). This article presents a complete and critical discussion of the profuse literature on this subject together with a report of six cases treated by the authors. The review of the literature is admirable and the bibliography complete.

The authors believe that neither of the premises on which Stephan based this method of small doses over the spleen in cases of purpura hemorrhagica, for stimulation purposes, is justified. There is no proof that small doses of radiation will stimulate the spleen, nor that increased splenic function will increase the coagulating powers of the body.

They treated six cases by this method. Two died and four were improved symptomatically. None were cured. The radiation had a temporary value, however, and there were no untoward effects.

In view of the apparent value of splenectomy in this disease it would seem more rational to give massive or destructive irradiation of the spleen rather than stimulant dosage.

LEO G. RICLER.

X-RAY TREATMENT OF BONE TUBERCULOSIS:

J. D. Southard, M.D., F.A.C.S., Fort Smith, Arkansas (*Radiology*, vol. 5, No. 1, pp. 34, 35, July, 1925). The following is a report of the treatment by x-ray of twenty-seven cases of bone tuberculosis, most of which were of long standing and in all of which the treatment was completed one or more years ago. Twenty-two cases were cured and five cases improved after an average period of little over four months under treatment. The bones affected were the ankle once, the arm three times, the femur once, the hip joint four times, the knee joint once, the pelvis twice, the spine four times, the sacrum three times, the sternum twice, and the wrist once.

Technic is varied according to the age and size of the patient and the location of the diseased bone, but in the average case the idea is to give from one-half to one erythema dose of filtered rays during the first month of treatment. No massive or lethal dose is needed and none used. The indication is to stimulate, nourish and encourage the living cells and tissues to dispose of the dead tissue by elimination or absorption and the phagocytes to take care of the tubercle bacilli present.

Treatment of five spinal cases was carried on without

any rest measures such as were used in most of the other cases and the results were particularly good. In cases where the lungs were involved they also were treated and were usually healed or quiescent by the time the bone was cured.

In conclusion, it is realized that the number of cases is not sufficient upon which to base final conclusions, but they are offered as indicating a safe and effective treatment of a most intractable disease.

JAMES A. CUTHBERT.

COMMON CAUSES OF SHOULDER PAIN: Butler and Elward (*Am. Jour. Roent.*, v. 13, p. 536, June, 1925). There are a large number of causes of shoulder pain both direct and indirect. The latter are due to referred impulses through the phrenic nerve and brachial plexus.

Ten causes of shoulder pain can be demonstrated by the use of one 10x12 sized roentgenogram. The x-ray examination of the shoulder is therefore a valuable aid in the detection of the causes of shoulder pain and the large sized film should be used.

This one examination may demonstrate any or all of the following:

Caries or erosion of the cervical vertebræ, cervical ribs, cervical arthritis, calcified cervical glands, spur on the clavicle, opaque subdeltoid bursitis, aortic aneurysm, apical tuberculosis, apical neoplasm, mediastinal new growth, Hodgkin's disease, and any demonstrable diseases or injuries to the shoulder joint itself. The information obtained as to conditions outside the shoulder joint is sufficient to stimulate further and more detailed examination.

LEO G. RICLER, M.D.

THE X-RAY EXAMINATION OF THE MALE URETHRA (Cave and Kohnstam. *Brit. J. of Radiology*, v. 30, p. 121, April, 1925). No preparation is needed. Lipiodol diluted with four times its volume of sterile paraffin is injected slowly and with constant pressure by means of a pressure flask. There were no harmful or irritative effects.

Plates are taken in the postero-anterior position with the tube over the bulb of the urethra and in the oblique position centering below the middle of Poupart's ligament.

Valuable information can thus be obtained as to the condition of the urethra and the presence, location, and extent of strictures. Pressure of an enlarged prostate will be shown and numerous other conditions in the posterior urethra can be made out.

LEO G. RICLER, M.D.

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Name	School and Date of Graduation	Address
Affeldt, Daniel Ernest.....	U. of Minn., M. B., 1925.....	Wykoff, Minn.
Anderson, Edwin Rudolf.....	U. of Minn., M. B., 1925.....	Montevideo, Minn.
Anderson, Leslie Percival.....	U. of Minn., M. B., 1925.....	603 Delaware St. S. E., Minneapolis.
Arnold, Duma Carroll.....	U. of Pa., M. D., 1920.....	Mondovi, Wis.
Benell, Otto E.	U. of Minn., M. B., 1925.....	University Hospital, Minneapolis.
Cardle, Archibald Evans.....	U. of Iowa, M. D., 1923.....	General Hospital, Minneapolis.
Carlson, Lawrence	U. of Minn., M. B., 1925.....	3813 Elliot Ave., Minneapolis.

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Craven, John Patrick.....	U. of Minn., M. B., 1925.....	General Hospital, Minneapolis.
Davidson, Magni	U. of Ill., M. D., 1925.....	Ancker Hospital, St. Paul.
Delougherty, Jos. Thos.....	U. of Minn., M. B., 1925.....	544 Temperance St., St. Paul.
Ditmore, David C.....	U. of Minn., M. B., 1925.....	City Hospital, St. Paul.
Donaldson, Chas. Scott	U. of Minn., M. B., 1925.....	808 Phys. & Surg. Bldg., Minneapolis.
Duryea, Marbry	U. of Minn., M. B., 1924.....	2314 Bryant Ave. N., Minneapolis.
Farnham, Marynia Foot	U. of Minn., M. B., 1924.....	General Hospital, Minneapolis.
Fetter, Mary	U. of Minn., M. B., 1925.....	1043 Lincoln Ave., St. Paul.
Froats, Chas. Wesley.....	Northwestern, M. D., 1925.....	Eveleth, Minn.
Gelber, Maksymiljan Robert.....	U. of Minn., M. B., 1925.....	General Hospital, Rochester, New York.
Glesne, Otto Neil.....	U. of Minn., M. B., 1925.....	Detroit Receiving Hospital, Detroit, Mich.
Goff, Charles Weer.....	U. of Ill., M. D., 1924.....	130 Oxford St., Duluth, Minn.
Good, Hoff Daniel.....	U. of Minn., M. B., 1925.....	Swedish Hospital, Minneapolis.
Gratzek, Frank Roman Edmund....	U. of Minn., M. B., 1925.....	N. P. Hospital, St. Paul.
Hartfiel, Wm. Fred	U. of Minn., M. B., 1925.....	Miller Hospital, St. Paul, Minn.
Hartwell, Shattuck Wellman.....	U. of Minn., M. B., 1925.....	962 Osceola Ave., St. Paul, Minn.
Hathaway, Joseph C.....	U. of Minn., M. B., 1925.....	1308 5th St. S. E., Minneapolis.
Hawkinson, John Philip.....	U. of Minn., M. B., 1925.....	329 Union St., Minneapolis.
Hawkinson, Lloyd Francis.....	Georgetown, M. D., 1923.....	Litchfield, Minn.
Hayden, Edward Martin.....	U. of Minn., M. B., 1925.....	629 Washington Ave. S. E., Minneapolis.
Heck, Frank Joseph.....	U. of Minn., M. B., 1925.....	418 Rice St., St. Paul.
Hultkrans, Rudolph E.....	U. of Minn., M. B., 1925.....	1608 Van Buren, St. Paul.
Johnson, Hobart Clemens.....	U. of Minn., M. B., 1925.....	228 Harvard St. S. E., Minneapolis.
Kliman, Frank E.....	U. Manitoba, M. D., 1924.....	St. Mary's Hospital, Duluth.
Lillehei, Elmer Julius.....	U. of Minn., M. B., 1924.....	4655 Grand Ave. S., Minneapolis.
Lundeberg, Karl Rosenius	U. of Minn., M. B., 1925.....	University Hospital, Minneapolis.
Madden, John Francis.....	U. of Minn., M. B., 1925.....	General Hospital, Kansas City, Mo.
Madsen, August H.	Rush, 4 year Cert. Med., 1924.....	Ancker Hospital, St. Paul.
Mattson, Hamline Aug. Nathaniel....	U. of Minn., M. B., 1925.....	5320 Clinton Ave. S., Minneapolis.
May, James Alan	U. of Minn., M. B., 1925.....	629 Washington Ave. S. E., Minneapolis.
Meier, Henry Van.....	U. of Minn., M. B., 1925.....	Abott Hospital, Minneapolis, Minn.
O'Rourke, Randall Michael.....	U. of Minn., M. B., 1925.....	749 Portland Ave., St. Paul.
Ostergaard, Erling	U. of Minn., M. B., 1925.....	Tyler, Minn.
Perry, Oliver Hazard.....	U. of Minn., M. B., 1925.....	St. Joseph Hospital, St. Paul.
Pierce, Willard Benjamin.....	U. of Minn., M. B., 1925.....	U. S. Naval Hospital, League Hospital, Philadelphia, Pa.
Rabwin, Marcus Hymond.....	U. of Minn., M. B., 1925.....	General Hospital, Los Angeles, Cal.
Rice, Carl O.....	U. of Minn., M. B., 1925.....	General Hospital, Minneapolis.
Saffert, Cornelius A.....	U. of Minn., M. B., 1925.....	General Hospital, Minneapolis.
Sherwood, Kenneth Kyler.....	U. of Minn., M. B., 1925.....	University Hospital, Minneapolis.
Sloan, Leonard Norman.....	U. of Minn., M. B., 1925.....	1715 8th Ave. N., Minneapolis.
Soderlind, Ragnar Theo.....	U. of Minn., M. B., 1925.....	1501 Washington Ave. S., Minneapolis.
Sorkness, Joseph	U. of Minn., M. D., 1924.....	317 Oak Grove St., Minneapolis.
Swanson, Wm. Walfred	U. of Minn., M. D., 1925.....	159 Arthur Ave. S. E., Minneapolis.
Swenson, Paul Christian.....	U. of Minn., M. B., 1925.....	Ancker Hospital, St. Paul.
Vories, Ruth Elizabeth	U. of Minn., M. B., 1925.....	General Hospital, Cincinnati, Ohio.
Webber, Fred L.....	U. of Minn., M. B., 1925.....	462 Beaumont St., St. Paul.
Weber, Harry M.....	U. of Minn., M. B., 1925.....	629 Washington Ave. S. E., Minneapolis.
Weissgerber, Louis Arthur.....	Toronto, M. B., 1921.....	Coleraine, Minn.
Wenner, Waldemar Thos.....	U. of Minn., M. B., 1925.....	629 Washington Ave. S. E., Minneapolis.
West, Anne	U. of Minn., M. B., 1925.....	406 5th St. S. E., Minneapolis.
Williamson, Geo. Albert.....	U. Manitoba, M. D., 1924.....	14 Church Club, St. Paul.
Youngren, Everett R.....	U. of Minn., M. B., 1925.....	Ancker Hospital, St. Paul.

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Anderson, Alan Ramseur.....	U. of Pa., M. D., 1923.....	Rochester, Minn.
Cowin, Abe Wilbur	Marquette, M. D., 1925.....	627 University Ave., St. Paul.
Lancaster, Wm. Ewart Gladstone....	Toronto, M. B., 1922.....	Abercrombie, N. D.
Martin, Thomas Philip.....	U. of Mich., M. D., 1902.....	Gary, S. D.
McLain, Liva Chas.....	Rush, M. D., 1915.....	Bakersfield, Cal.
Moquin, Marie Antoinette.....	P. & S., Wis., M. D., 1911.....	Lowry Bldg., St. Paul, Minn.
Toomey, John M.....	Hah., Pa., M. D., 1923.....	5701 Grand Ave., Duluth.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

THE VITAL CAPACITY OF THE LUNGS. J. A. Myers, M.D., Asst. Professor of Preventive Medicine and Public Health, University of Minnesota, Minneapolis. 140 pages. Illus. Cloth, \$3.25. Baltimore, Williams & Wilkins Company, 1925.

DISEASE OF THE BRONCHI, LUNGS AND PLEURA. Frederick T. Lord, M.D., Visiting Physician, Massachusetts General Hospital; Instructor in Medicine, Harvard Medical School. Second edition, revised and enlarged. 776 pages. 107 engravings. 3 color plates. Cloth, \$8.00. Philadelphia: Lea and Febiger, 1925.

THE PRACTICAL MEDICINE SERIES. GENERAL

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WANTED—Position in Physician's Office by Registered Nurse. Seven years' experience. Can keep books and manage office. Address Helen J. Cribb, care of Dr. R. E. Farr, 306 Physicians and Surgeons Bldg., Minneapolis.

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WANTED—Internist to join central Minnesota group. Northwestern or Rush man preferred. Must have some general practice and post graduate foundation. Address C-41, care MINNESOTA MEDICINE.

SURGERY. Vol. II. Albert J. Ochsner, M.D., Editor. Chicago: The Year Book Publishers, 1924.

This compact little book, edited by A. J. Ochsner, which, with its various contributors, gives us a fairly complete review of a large part of the past year's important literature of clinical surgery. Each individual field of surgery has been reviewed in some detail, beginning with the types of anesthesia, pre-operative and post-operative care, the various types of new instruments, and the surgery of the individual parts of the body.

In the latter division, especially, has a lot of stress been laid on certain methods now used for obtaining relief through surgical interference, such as the proper time to operate in diseases of the thyroid, the method of thoracoscopy of Jacobus and the further treatment of various types of fractures.

M. W. ALBERTS, M.D.

WANTED—Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

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GENERAL LABORATORY and expert technician with nine years' experience wishes position with hospital or clinic, preferably in Minnesota. Address No. A-120, care MINNESOTA MEDICINE.

MINNESOTA MEDICINE

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MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association
Northern Minnesota Medical Association and Minneapolis Surgical Society*

Vol. VIII

OCTOBER, 1925

No. 10

SUB-ACUTE BACTERIAL ENDOCARDITIS*

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I take the liberty to present two brief case histories of sub-acute bacterial endocarditis in order to call your attention to a change in the point of view which is taking place in the minds of clinicians and pathologists of this center, regarding this disease.

CASE 1.—Miss O. S., a schoolgirl, aged fifteen, entered the University Hospital June 29, 1924, complaining of cardiac insufficiency and pain in the left knee and left ankle with swelling. Four years before this she had had an attack of chorea, with a heart lesion. Since then there had been dyspnea and palpitation on exertion. In April, 1924, the left knee and left ankle had been swollen and painful, which promptly cleared. In May the left elbow and wrist became swollen and painful. This also promptly cleared up. Both of these attacks put the patient to bed for a few days. At the end of May she had an infected mouth. About June 1, she was told she had heart disease and anemia. She was in bed up to June 15. June 19 the left knee again became painful and swollen, and pain persisted until her entrance into the hospital June 29. She had enjoyed good health up to her chorea in 1920. She had had two attacks of pleurisy, the last one in 1923. A tonsillectomy was done in 1920. Menstruation started in 1923. She menstruated three times. Since October, 1923, there had been no menstrual flow.

Her physical examination on entrance revealed: lungs clear, abdomen, negative. Mitral type of heart. Many infected teeth. Left ankle and foot swollen. Her blood picture was: hemoglobin 65 per cent, r.b.c. 3,000,000, w.b.c. 11,000. The differential count gave 62 per cent polymorphonuclear cells. There were red and white blood cells in the catheterized specimen of urine. The blood culture was negative.

A diagnosis of sub-acute rheumatic fever, cardiac insufficiency, valvulitis,—double mitral, possibly aortic,—possible bacterial endocarditis was made.

During her stay, her temperature range was never above 102, with afebrile periods. During July, the blood cultures were negative. In August a streptococcus viridans was isolated from the blood and petechiæ were present over the trunk and extremities. A progressive anemia was noted. The leucocytes ranged from 11,000 to 18,000. In

October an embolus of the left cerebral artery was noted, and in November a meningitis developed. The patient died November 23, 1924.

The clinical diagnoses were as follows:

1. Acute rheumatic fever.
2. Chronic valve defect (mitral insufficiency, stenosis).
3. Sub-acute bacterial endocarditis.
4. Focal nephritis (glomerular, embolic).
5. Vegetations on aortic leaflets (not found at autopsy).
6. Hemiplegia (cerebral embolus).
7. Acute meningitis (terminal, streptococcus viridans).

Postmortem: At autopsy, beside the embolic processes in the kidneys, spleen and brain, the interesting organ was the heart. This presented the following points (notes by Dr. E. T. Bell): Maximum width 12.5 cm. There was marked dilatation of the right auricle and moderate hypertrophy of the left ventricle. The epicardium was smooth and clear. The weight 255 gms. There were no lesions on the right side. The auricle showed numerous mural thrombi extending from the mitral valve up onto the left side of the chamber. These thrombi were fairly firm, but had soft superficial portions. The mitral showed a moderate, diffuse thickening. There were numerous thrombi attached to the leaflets. Most of these were fairly firm, but had softened superficial portions. There was no lesion at the root of the aorta.

Pathological Diagnosis:

1. Sub-acute bacterial endocarditis (mitral valve and left auricle).
2. Encephalomalacia due to embolism of left middle cerebral artery.
3. Cloudy swelling of the liver and spleen.
4. Old infarct in the spleen and kidneys.

Additional histological notes: Embolic glomerular nephritis. Valve showed proliferation of thrombi, Aschoff bodies in the myocardium. Liver shows passive congestion.

CASE 2.—Miss M. H., clerk, aged twenty-three. Patient entered the General Hospital, February 18, 1924, complaining of dizziness, weakness, palpitation and cough. In January, 1924, she had had an attack of rheumatism, which cleared up in two weeks and was followed by the symptoms just mentioned. The past history elicited scarlet fever at the age of four; tonsillectomy at nineteen; at seventeen she had had an attack of rheumatism, similar to the attack of January, 1924, but more severe, as she was confined to bed for a month, and after this attack she noticed edema of the ankles and dyspnea on exertion for a long time. The family history was negative. The physical examination was as follows: Chest clear; abdomen negative; neurological examination negative; heart enlarged, with double mitral murmur. The laboratory findings were: Hemoglobin 80 per cent, r.b.c. 4,770,000,

*Presented before the Minnesota Academy of Medicine, March 11, 1925.

w.b.c. 5,800; differential of 73 per cent polymorphonuclear cells; urine, catheterized specimen: many hyalin and granular casts present, few r.b.c., specific gravity 1.025, a trace of albumen. *Impression:* (1) rheumatic fever; (2) endocarditis with decompensation; (3) valvular defect,—mitral stenosis with regurgitation; (4) possible pericarditis with effusion; (5) possible renal involvement.

Several days later an aortic lesion was made out and petechiæ were noted on the lower extremities. Blood pressure 104-40, and spleen was palpated. The temperature ranged to 103. This patient grew progressively worse. The hemoglobin dropped to as low as 38 per cent. The leucocytes were never lower than 5,000. Blood cultures were positive on February 20 and on March 7. The patient died April 6, 1924.

The *clinical diagnoses* were:

1. General septicemia.
2. Sub-acute bacterial endocarditis.
3. Valvulitis,—mitral and aortic.
4. Acute fibrinous pericarditis.

At *postmortem* there was evidence of cardiac death. (Notes by Dr. Kano Ikeda.). The liver was enlarged. There was obliteration of the pericardial space. The heart measured 14 cm. at its greatest diameter, and weighed 365 grams. The myocardium was pale and soft. There were fresh vegetations on the mitral valve, an irregular growth extending upward from the posterior mitral to the aortic, where a few additional patches of vegetations were present. There were small scattered islands of vegetation scattered over the endocardium of the left ventricle just below the aorta. The root of the aorta showed a few yellowish raised patches. The spleen weighed 240 gms.

The *pathological diagnoses* were:

1. Sub-acute bacterial endocarditis (mitral and aortic).
2. Adherent pericardium.
3. Streptococcic septicemia.
4. Embolic glomerular nephritis.
5. Cloudy swelling of the spleen, liver and kidneys.
6. Infarction in the spleen.
7. Acute ulcerative colitis.
8. Hypostatic congestion with beginning pneumonia of the right lower lobe.
9. Generalized petechiæ.

Additional histological examination showed an embolic glomerular nephritis, two types of proliferation and infected thrombi on the valves.

These two cases presented typical symptoms of rheumatic endocarditis at the time of their inception at the hospital. Only a hospital staff, acquainted with the views which will be given, would have included the supposition of bacterial endocarditis at the beginning of these two girls' illnesses. Other writers have called attention to the fact that bacterial endocarditis is often ushered in with symptoms simulating rheumatic fever. This clinical similarity is a striking point, when it dawns on one that the two diseases may have the same etiological origin. Clinically, they criss-

cross in our minds and it has been gradually coming to us, that rheumatic and sub-acute bacterial endocarditis are milder and severer forms, respectively of one and the same disease. Their difference lies in the local reaction in the heart and this variation in reactivity accounts for the differences in the clinical as well as the prognostic picture.

We have been accustomed to think of these two diseases as two separate clinical entities: in rheumatic endocarditis, the etiological agent being unknown; in the sub-acute, the streptococcus viridans being the common offender. In acute rheumatic fever the prognosis is exceedingly good. (Thayer¹ was only able to collect twenty-five cases at post-mortem in thirty-five years at the Johns Hopkins Hospital; Dr. Clawson,² seventeen cases in fifteen years.) In bacterial endocarditis, the prognosis is practically hopeless. In rheumatic endocarditis, the absence of embolic processes, including splenic enlargement, sharply differentiates it from the sub-acute type. The age incidence in the former is in the first three decades of life; in the latter, it is in the second, third and fourth decades. Pericardial complications in the rheumatic endocarditis is given as a differential factor from that of the sub-acute. The blood picture is also supposed to be different; in rheumatic endocarditis there is possibly less anemia, and perhaps more leucocytosis. Anatomically, the pictures certainly are different. In rheumatic endocarditis one has verrucous thickening on the valves and Aschoff bodies in the myocardium; in the sub-acute, the mural vegetations and the softer vegetations on the valves.

Recently, Dr. Clawson³ of the Pathological Department of the University of Minnesota has gone over these laboratory variations and finds there are no distinctions. He has been able, under adverse conditions, to get positive blood cultures of streptococcus viridans, in twenty-five cases of acute rheumatic fever, which is 50 per cent positives. Under ideal conditions, he thinks he can raise this to 80 per cent positives. In the sub-acute endocarditis he has had 90 per cent positive streptococcus viridans blood cultures.

Immunologically, he divides these organisms into two groups: one the homologous group, the other the heterogeneous group. The homogeneous group agglutinated with heterologous sera from both clinical types; the heterogeneous only with homologous blood. In animals (rabbits), similar lesions are provoked from the homogeneous strains

of either clinical type. The isolation of the same organisms, with Koch's postulates observed, is additional proof of the single etiological origin of these two clinical types.

The explanation of the anatomical differences of the two clinical types is purely one of local reactivity of tissues. In one the proliferative predominates; in the other the exudative.

In the valves affected, he finds no difference. In the sub-acute, the aortic is supposedly not common. Out of eighty cases, he finds twenty-three aortic involvement alone. In the rheumatic group, there was no pure aortic lesion alone. But out of one hundred and fifteen old rheumatic cases, there were twenty-one aortic lesions alone. Mural involvement was present in 39 per cent of the sub-acute group and in none of the rheumatic group. Thayer finds mural involvement in 20 per cent of his cases. The incidence of pericarditis in sub-acute endocarditis is 20 per cent; in rheumatic 63 per cent. This has always been considered a point of differentiation. Clawson looked up the records in old healed lesions of rheumatic type, and finds there is pericarditis present in 20 per cent. This high incidence, 63 per cent, in acute rheumatic cases is due to the fact that death occurs from pancarditis, therefore the incidence of pericarditis is *apparently* high, because these cases are more apt to die.

Splenic enlargement is found in 25 per cent of the sub-acute group, and only 5 per cent of the rheumatic group.

The blood picture showed a hemoglobin in rheu-

matic endocarditis ranging from 90 per cent to 60 per cent. Out of the sub-acute cases there were fifteen below 60 per cent. The red counts averaged the same in the two diseases. There is a tendency to leucocytosis in both diseases. In the rheumatic there were two cases below eight thousand, and in ten cases out of forty-nine sub-acute cases. The blood pictures are suggestive of a difference, but this is not conclusive.

So that the real differentiation of the two clinical entities is in the embolic processes. We have the same organism present, practically the same blood picture and the same clinical picture until embolic processes are evident.

To summarize, all points of difference in these two clinical types are found to be apparent and not real. Clinically, the only striking variation is the evidence of embolic processes, and this depends on anatomical variation, which again depends on the reactivity of the tissues of the heart. While we do not wish to destroy the clinical entity of these two types, we do wish to emphasize their common origin. We still have to differentiate the two for prognostic reasons. The finding of streptococcus viridans with an active heart lesion, however, does not indicate the presence of a sub-acute endocarditis, in the usual sense of the word. Not until evidence of embolic processes is obtained, can we tell that we are dealing with the grave form of endocarditis.

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THE NEW PHARMACOPEIA

The United States Pharmacopeial Convention met in Washington in May, 1920, and appointed a committee to revise the Pharmacopeia of the United States. The new Pharmacopeia was placed on sale August 15; it becomes official January 1, 1926. The responsibility for the scope of the new Pharmacopeia was placed on the twenty-one members who held the degree of Doctor of Medicine. Consequently, the new book should more nearly represent rational medicine than some of the preceding revisions in which pharmacists and pharmaceutical manufacturers largely controlled the situation. From the standpoint of the physician, the most noteworthy feature of this revision is the fact that but forty new drugs and preparations were added, while 192 have been deleted. The additions are drugs which give promise of therapeutic worth: thirty-one of them are already described in New and Non-official

Remedies. The omission of such substances as arnica, calcium hypophosphite, cerium oxalate, coriander, grindelia, hops, lactucarium, three lithium salts, matricaria, prickly ash, musk, parsley, pepper, saw palmetta, stillingia, sumbul and taraxicum is a distinct aid to scientific medicine. The retention of sarsaparilla is to be regretted. An effort has been made to simplify the Latin titles. Examples are: the substitution of Cinchophenum for Acidum Phenylcinchoninicum; Methenamina for Hexamethylenamina; Liquor Pituitarrii for Liquor Hypophysis. Whereas the present Pharmacopeia requires that two drugs and their preparations be standardized biologically, the new book requires that eight must be so standardized. The unit of measurement, the milliliter (abbreviation "Mil"), which is used in the present Pharmacopeia has happily been abandoned again and the familiar cubic centimeter (abbreviated "c.c.") restored.

(*Jour. A. M. A.*, Aug. 29, 1925, p. 678.)

CORRECTIVE LEGISLATION*

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By an amendment passed at the last session of the Minnesota State Legislature, the Statute of Limitations governing actions for malpractice in the State of Minnesota was changed from six to two years. The present law, as signed by the governor March 27, 1925, and which will become effective three months thereafter, is as follows:

"Section 9193, Gen. Stat. 1923. The following actions shall be commenced within two (2) years: 1. For libel, slander, assault, battery, false imprisonment, or other tort, resulting in personal injury, and all actions against physicians, surgeons, dentists, hospitals, sanitariums, for malpractice, error, mistake, or failure to cure, whether based on contract or tort; provided, a counterclaim may be pleaded as a defense to any action for services brought by a physician, surgeon, dentist, hospital or sanitarium, after the limitations herein described notwithstanding it is barred by the provisions of this chapter, if it was the property of the party pleading it at the time it became barred and was not barred at the time the claim sued on originated, but no judgment thereof except for costs can be rendered in favor of the party so pleading it."

Every member of the Minnesota Medical Association, every member of the medical and dental profession, every hospital and sanitarium is highly pleased and delighted with this accomplishment.

In development of the subject assigned it must be understood that every rule of law governing malpractice litigation has its source in either the acts of your State Legislature or in the judicial decisions of your Supreme Court.

I wish to call your attention to some features of the present law of this state with respect to the defense of malpractice cases which cause a decided hardship to the defendant in such a suit and which are a great handicap in the defense of these cases.

1. An expert, according to the judicial decisions of this state, is permitted to express an opinion as to the degree of care and skill exercised by the defendant in a malpractice case, or the propriety or impropriety of his treatment, from the results obtained from that treatment.

This rule of law contravenes some very just and salutary principles of law. One of the fundamen-

tal principles of malpractice law prevailing everywhere and pronounced by your Supreme Court, is to the effect that a bad result is no evidence of negligence on the part of the attending physician nor does a bad result raise a presumption that the physician has been negligent in his treatment. This pronouncement of law has been beautifully stated by your Supreme Court in its decision of the case of *Martin vs. Courtney*, August 8, 1902, as cited in 87 Minn. 197, 91 N. W. 487, where this language is found:

"The legal obligation of the physician to his patient, where his conduct is questioned in an action of this character, demands of him no more than the exercise of such reasonable care and skill as is usually given by physicians or surgeons in good standing of the same school of practice. (Citing authorities.) To exact more than this would be an unjust imposition upon the physician, to encourage expectations of miraculous power that could not be fulfilled, for he is not an insurer of absolute success. The white headstones and monuments that glisten in the sunshine within the sacred precincts devoted to the repose of the dead in the suburbs of every city and hamlet in the land testify with unerring certainty that man is mortal, and the most effective efforts of the healing art are incapable of resisting the conqueror of all."

Your Supreme Court has given some very convincing reasons why a bad result is not of itself evidence of negligence on the part of a physician in his ministrations to the sick and injured. These reasons are set forth in the following quotation from *Williams vs. Poppleton*, 3 Ore. 139, as stated and adopted by your Supreme Court in the case of *Staloch vs. Holm*, decided March 7, 1907, and reported in 100 Minn. 276, 111 N. W. 264:

"The surgeon does not deal with inanimate or insensate matter like the stone mason or bricklayer, who can choose his materials and adjust them according to mathematical lines, but he has a suffering human being to treat, a nervous system to tranquilize, and an excited will to regulate and control. Where a surgeon undertakes to treat a fractured limb, he has not only to apply the known facts and theoretical knowledge of his science, but he may have to contend with very many powerful and hidden influences, such as want of vital force, habit of life, hereditary disease, the state of the climate. These or the mental state of his patient may often render the management of a surgical case difficult, doubtful, and dangerous; and may have greater influence in the result than all the surgeon may be able to accomplish, even with the best skill and care."

The unjust rule of law which has just been mentioned and which permits an expert to condemn the

*An address delivered before the Economics Section of the Minnesota State Medical Association, April, 27, 1925.

treatment in question from the results alone, had its origin in your Supreme Court in the case of *Sawyer vs. Berthold*, decided January 12, 1912, and reported in 116 Minn. 551, 134 N. W. 120. That was a case in which the plaintiff sought to recover damages for alleged negligence on the part of the attending physician in the treatment of a Colles' fracture. Dr. Wilcox, an expert witness called by the plaintiff, testified in substance that such a deformity as was presented by the plaintiff following a fracture of the wrist such as plaintiff had sustained, would generally indicate improper treatment. However, he qualified this by the statement that there are some cases in which such a result could not be avoided. This was essentially all the expert testimony offered by the plaintiff in that case. The defendant objected to such testimony because Dr. Wilcox based his opinion of improper treatment upon the results alone. The court held this testimony was admissible and in so deciding used this language:

"It is undoubtedly correct that negligence of a physician or surgeon cannot be inferred from a poor result alone. There must be evidence from expert witnesses tending to show improper or unskillful treatment, in order to sustain a charge of malpractice against the physician. But this is not saying that an expert witness may not base his opinion that the treatment was improper wholly on the result, or that a court or jury cannot base its decision upon such an opinion."

Obviously the above rule of law as pronounced by your Supreme Court is not a mere inadvertence or error on the part of that dignified tribunal because the Supreme Court has reaffirmed this vicious and unjust rule of law which governs malpractice litigation in this state. In *Viita vs. Dolan*, decided January 21, 1916, reported in 132 Minn. 128, 155 N. W. 1077, the plaintiff sought to recover damages on account of alleged negligent treatment of a fracture of the leg between the knee and ankle. The result of the injury and treatment was an eversion of the foot. There the Supreme Court reaffirmed the doctrine of the *Sawyer vs. Berthold* case by using the following words, which are taken from the *Viita* decision:

"We need not repeat what was said in *Sawyer vs. Berthold*, 116 Minn. 441, 134 N. W. 120, to the effect that an expert witness may base his opinion on the results alone," etc.

Again we find this same doctrine appearing in the case of *Holt vs. TenBroeck*, decided November

24, 1916, 134 Minn. 458, 159 N. W. 1073, where the court says:

"A physician who qualified himself as an expert in the application of the X-ray was permitted to give his opinion, based upon the result of the operation, that the application was improper. This was not error. The ruling is in harmony with *Sawyer vs. Berthold*, 116 Minn. 441, 134 N. W. 120."

As late as 1917 this monster was not dead. We find it again raises its head to vex the defendant in the case of *Peterson vs. Branton*, decided May 25, 1917, reported in 137 Minn. 74, 162 N. W. 895. There the plaintiff sought to recover damages from Dr. Branton for alleged negligence in the treatment of a fractured arm. Dr. Johnson was called as an expert witness for the plaintiff. His testimony was:

"Taking into consideration the condition of the plaintiff's arm, he would say the treatment was improper."

The defendant objected to the testimony at the time it was offered, and set up the admission of the testimony as one of the grounds for reversal. When the case was brought before the Supreme Court, after a verdict and judgment had been rendered in favor of the plaintiff, the Supreme Court reaffirmed the rule of law as announced in the *Sawyer vs. Berthold* case and quotes the following from the *Sawyer* decision:

"In an action against a physician to recover damages for negligence or unskillful treatment of a patient, the result alone is not evidence of negligence; but an expert witness may give his opinion, based upon the result, that the treatment must have been improper, and such an opinion is evidence upon which the court or jury may find negligence."

As heretofore stated all malpractice law is derived from one of two sources. First, a legislative enactment or judicial decision. If a law is bad, vicious and unjust and there is a desire to change the law, the attention should be directed to the institution or department of government that has created and given birth to the obnoxious law. If the parent of the offspring cannot or will not reform the mischievous child, then that other source of law may be appealed to with expectation of certain relief.

2. Under the decisions of your Supreme Court an injured employee may receive compensation under the Workmen's Compensation Act for his entire disability, whether due to the original injury

or to an aggravation of the injury resulting from the negligence of the attending physician, and may thereafter maintain a malpractice action against the physician.

There is now pending in the District Court of Hennepin County a malpractice action in which the plaintiff is seeking to recover for the loss of a leg which he alleges in his complaint is due to the negligence of the defendant in the treatment of a certain injury that he had previously received. An investigation disclosed that the injury for which he was treated arose out of his employment and had occurred while he was in the course of his employment; that he had finally lost the leg by amputation. He applied for and was awarded compensation for the loss of his leg at the rate of \$16.80 per week for a period of two hundred weeks. After he was fully advised of all the consequences of his injuries, he then instituted this malpractice action to recover the same element of damages for which he had been awarded compensation.

There seems to be no question but what the intention of the Legislature when the Workmen's Compensation Act was passed and enacted into a law, was to simply create in favor of the injured employee a new remedy by which redress might be obtained. The injured employee under the Workmen's Compensation Act is able to recover the same elements of damage as he could under his old common law right of action. The amount of compensation may not be so great in some cases, but it is secured without delay and without great expense to the injured employee. The purpose of the Workmen's Compensation Act is stated in the title of the act itself as follows:

"An Act prescribing the liability of an employer to make compensation by way of damages for injuries due to accident received by an employee arising out of and in the course of employment, modifying common law and statutory remedies, in such cases; establishing an alternative elective schedule of compensation, regulating procedure for the determination of liability and compensation thereunder in certain cases, and prescribing penalties for the violation thereof."

Compensation is not in the nature of a charity, a pension or a gratuity, nor is it a penalty imposed upon the employer. This is well stated in the case of *State vs. Industrial Commission*, 92 Ohio St. 434, 111 N. W. 299, as follows:

"Again, this law was passed, not in a spirit of charity, but only simple justice. The fund it provides is called, and is in fact, an 'insurance' fund, from which payments are to be made, and is in no sense a pension fund, and never so far as we are aware has it been contended that injured employees and their dependents were not entitled to compensation as a matter of right. The right to be compensated for an injury has no element of bounty or charity about it. No part of the fund (except such part as it pays for the protection of its own employees) is contributed by the state."

And in *Brenner vs. Brenner*, 127 Md. 189, 96 Atl. 287, the court in its interpretation of the purposes of the Workmen's Compensation Act says:

"The object and purpose of such legislation has been two-fold: first, in cases of injury to employees to provide a speedy and inexpensive method by which compensation might be made to them or those dependent upon them without the delay of long and tedious litigation, and at a minimum of costs; and, secondly, to substitute a more uniform scale of compensation in cases of accident than could be obtained from the varying and often widely divergent estimates of juries, and also to avoid the application of certain well established rules of law, which in some cases have seemed to be harsh in their operation."

Wangler Boiler & Sheet Metal Works Co. vs. Industrial Comm. (Ill.), 122 N. E. 366:

"Compensation under the act in question (Workmen's Compensation Act) is analogous to and is to take the place of damages at common law and under the statute."

As a further exemplification of the purpose of the Workmen's Compensation Act we quote from *Stertz vs. Industrial Insurance Commission (Wash.)*, 158 Pac. 256, as follows:

"Our act came of a great compromise between employers and employed. Both had suffered under the old system; the employers by heavy judgments, of which half was opposing lawyers' booty, the workmen through the old defenses of exhaustion in wasteful litigation. Both wanted peace. The master, in exchange for limited liability, was willing to pay on some claims in future, where in the past there had been no liability at all. The servant was willing, not only to give up trial by jury, but to accept far less than he had often won in court; provided he was sure to get the small sum without having to fight for it."

Under his common law right of action before the passage of the Workmen's Compensation Acts, an injured employee could recover from his employer, if it were shown the injuries were due to the employer's negligence, not only damages for the original injury, but also damages on account of

negligence for malpractice, if any, of the attending physician.

In *re Viou vs. Brooks-Scanlon Lumber Company*, 99 Minn. 97, 108 N. W. 891, your Supreme Court with respect to the above proposition said:

"The mere fact that injuries caused by the negligence of the person sought to be charged have been increased by the negligence of an attending physician does not relieve that person of consequent liability."

And in *Field vs. Mankato Electric Traction Company*, 116 Minn. 218, 133 N. W. 577, on this same point your Supreme Court, speaking through Justice Simpson, said:

"Whether the physicians skillfully or unskillfully performed the necessary services, the plaintiff not being in fault in any matter, her impaired physical condition at the time of the trial followed in unbroken causal sequence the negligence of the defendant," etc.

So far as my own research has extended, no decision from your Supreme Court has been found decisive of the question as to the employer's liability, under the Workmen's Compensation Act, for an aggravation of an injury or an increased disability due to the negligence or mistake of the attending physician. However, in *Viita vs. Dolan*, supra, although that particular question was not before the court, yet the court took occasion to say:

"The employer, as we have seen, was not liable to the employee for the negligence of a physician. It was not required to compensate plaintiff for damages sustained by their malpractice," etc.

It may be enlightening and interesting to know what other courts have said on this particular point. In *Ross vs. Erickson Construction Company*, 89 Wash. 634, 155 Pac. 153, the court there said:

"The consequences of malpractice is an element which will be reconsidered by this state."

Pawlak vs. Hayes (Wis.; 1916), 156 N. W. 464.

"The Compensation Act requires the employer to furnish a physician, and makes him liable for the value of the physician's services for not to exceed 90 days. * * * * * This, we think, implies liability for any aggravation of the injury caused by the negligence of the physician treating the employee during such time."

The Supreme Court of Oklahoma was squarely faced with this very question in the case of *Cook vs. Booth Flinn, Ltd.*, 79 Okla. 280, 193 Pac. 36, and that court's answer was as follows:

"Under Workmen's Compensation Acts, an employer is liable for all the consequences following an accident, including unskillfulness or error of judgment of a physician furnished the injured employee as required by Section 4. of our Workmen's Compensation Act."

This question was again before the Supreme Court of Oklahoma in the case of *Brown vs. Sinclair Refining Company*, 206 Pac. 1042, where the rule of law as announced in *Cook vs. Booth Flinn, Ltd.*, was reaffirmed.

Where a person has been injured and makes a claim, under his common law right of action, and a settlement with the person whom he thinks has caused his injuries, and the settlement includes all injuries sustained whether due to the malpractice of the attending physician, according to the weight of authority and good reason, he cannot maintain an action against the attending physician to recover for damages on account of alleged malpractice.

As authority on this point, attention is called to *Hooyman vs. Reeve* (Wisc.), 170 N. W. 282. In that case the plaintiff was employed by the Appleton Coated Paper Company and was injured under circumstances which caused him to think the Paper Company was responsible. After all his injuries were fully and completely known to him, he settled with the Paper Company for \$3,000, and stated in a release that the amount included all his injuries. He thereafter commenced this action to recover damages for alleged malpractice, which damages were necessarily included in the settlement with the Paper Company. When the question was properly brought before the Supreme Court of Wisconsin it decided that he could not maintain the malpractice action. In passing on the question that court said:

"The malpractice, if any, contributed to produce the injury settled for and satisfied by the master; hence such cause of action against the defendant was compensated for and extinguished by the settlement made. Clearly the settlement covered all damages sustained, including injury caused by the alleged malpractice."

This same question was before the Supreme Court of Washington in the case of *Martin vs. Cunningham*, 161 Pac. 355. In that case the plaintiff, at the time he received the injuries for which he was treated by the defendant, was employed as a fireman by the Great Northern Railway Company. In jumping from his engine to avoid a head-on collision he sustained a fracture of the tibia of the

left leg. After all consequences of his injuries were fully known to the plaintiff, he negotiated a settlement with the Great Northern Railway Company for \$8,000, and executed a release in which it was stated that the amount was for all damages that he had sustained or might thereafter sustain by reason of the alleged injury. He thereafter brought a malpractice action. The court held that same could not be maintained. In that decision the following language may be found:

"Conceding malpractice on respondent's part, as charged by the complaint, we think appellant is precluded from a recovery against him. The railway company was liable not only for the injury and resulting suffering of appellant, but also for the malpractice of the attending surgeon and for the expenses of medical attendance. Having that liability in view, the company settled with him, paying him a substantial sum for a release from further liability. At the date of the release the appellant had already suffered from the alleged malpractice and had employed another surgeon to remedy it, to whom he had paid \$500 for the service. These were all matters that could be enforced against the railway company under its liability for damages, and the settlement was clearly made with a view to covering all those elements of damages. They were known to exist by the parties to the release, and the settlement was made with reference to them. The release, having been made in full satisfaction of all existing claims, precludes the appellant from bringing a second action for malpractice against the surgeon, occupying somewhat the position for a joint tortfeasor, to recover double compensation for what he has already been satisfied."

Another case decisive of the question is *Guth vs. Vaughan*, 231 Ill. Ap. 143, where the court says:

"It follows, therefore, that when the plaintiff signed the document of July 13, 1918, in which he recited that he received \$225 from Florsheim which he acknowledged 'to be in full accord and satisfaction of a disputed claim growing out of bodily injuries sustained by him on July 6, 1918, and by which document he further recited that he thereby released and forever discharged Florsheim 'from any and all actions, cause or causes of actions, claims and demands, for, upon, or by reason of any damage, loss, injury or suffering' which he had suffered or would suffer 'in consequence of such accidents and injury,' he must be considered, as a matter of 'equity and good conscience,' and, so, in the eyes of the law, as having received full satisfaction; and he will not be allowed to recover again for the same injury or its aggravation by malpractice."

From the above authorities and upon logic and principle it ought to be held by the courts that where an employee has been injured while in the

course of his employment, and has applied for and received compensation for all the disability that he has suffered, which in many cases must necessarily include a disability due to the aggravation of the original injury on account of error of judgment or mistake of the attending physician, the employee ought not therefore be permitted to have a double recovery in a malpractice action against the attending physician.

This question has been before the courts only on very few occasions. The Supreme Court of Washington had the question presented to it in the case of *Ross vs. Erickson Construction Company*, 155 Pac. 153. The plaintiff in that case had been injured in the course of his employment, had applied for and received his compensation and he thereafter sued his employer and the attending physician to recover damages for alleged malpractice of the attending physician in the treatment of the injuries that he had received in the course of his employment. The award and receipt of compensation was set up as a defense and the Supreme Court of Washington there held that it was a valid defense, inasmuch as the Compensation Act and the compensation for an injury received thereunder, included the very element of damages for which the plaintiff was seeking a recovery, and consequently the plaintiff's malpractice action could not be maintained.

The same question was presented to the Appellate Division of the Supreme Court of New York in the case of *Pitkin vs. Chapman*, 200 N. Y. S. 235. In that case the plaintiff had been injured in the course of his employment. He had applied for and received compensation in the amount of \$1,374.26. He thereafter instituted the malpractice proceedings against his attending physician. Compensation was set up as a defense. The court there held that it was a valid defense and a bar to the malpractice proceedings. We find this language in that decision:

"If a person injured employs, in good faith, a physician reputed competent, the original wrongdoer cannot escape entire liability, though the injuries are aggravated—or even though death results—because of mistakes in medical treatment. A wrongdoer cannot take advantage of the mistakes of a physician or surgeon in treating the injury. The mistake of the physician could not have occurred but for the original wrong. Therefore, he is not an intervening person responsible to the injured, if the injured seeks to hold only the original wrongdoer.

"This has been held so often in actions at common law that in such cases it is not an open question. The Workmen's Compensation Law does not alter this just and salutary principle. There can still be but one compensation for one wrong. That act provided a sure and certain compensation for a workman injured in the course of his employment. It did not provide or attempt to provide, in contravention of the common law, there could be two recoveries for what the common law had heretofore held to be one wrong—one injury."

Let us now see how the Supreme Court of Minnesota has answered this question. We have heretofore referred to the case of Viita vs. Dolan, decided January 21, 1916, and reported in 132 Minn. 128, 155 N. W. 464. In that case the plaintiff was injured in the course of his employment with the Johnson-Wentworth Company in skidding logs on February 5, 1914. His injury consisted of a fracture of the left leg between the knee and the ankle. He was thereafter treated by the defendants, Dr. Dolan and Dr. Fleming. On June 1, 1914, the plaintiff and his employer agreed upon a settlement for the injuries received by the plaintiff and petitioned the court for its approval under the terms of the Workmen's Compensation Act. The court approved of the settlement agreed upon, which contained the provision that when all payments thereunder had been made the employer was released from all claims on account of said injury under said act or otherwise. The above malpractice suit was thereafter instituted. The Supreme Court held that the employer, the Johnson-Wentworth Company, was not liable for any damages resulting from the malpractice of the attending physician. In the opinion the Supreme Court says that that element of damages was not included in the settlement, and consequently it was held that the settlement would not bar the malpractice action.

The question was again before the Supreme Court in the case of Berkholz vs. Benepe, decided November 3, 1922, and in that opinion we find this language:

"Plaintiff because of defendant's negligence was incapacitated for an additional period of six months. It is true, his hospital bills were paid, and the damages for loss of time were in a measure lessened to him because of the benefits of the Workmen's Compensation Act (Gen. St. 1913, Sec. 8195-8230); but the benefits so received do not go to mitigate or reduce the damages for additional lost time properly attributed to defendant's negligence. The benefits derived under the Compensation Act can well be placed, at least as to tort-feasors subsequent to the injury, in the same class as insurance carried by the injured party, which

has been held to not mitigate the damages for which the wrongdoer is liable."

You will note from the last quotation the tendency of the Supreme Court of Minnesota to hold that compensation received by an injured employee for injuries received while in the course of his employment under the Workmen's Compensation Act, is not a bar to a subsequent malpractice case where he seeks to recover the same element of damages as he has recovered by way of compensation. This ought to be changed, and to make such a defense available to a defendant in a malpractice case there necessarily should be an amendment to the Workmen's Compensation Act which will cure the defect. This should be carefully considered by the Legislative Committee of your organization.

3. A charitable hospital under the decisions of the Minnesota Supreme Court is liable to a patient for injuries that a patient may have sustained through negligence of an agent or employee of the charitable institution.

This doctrine contravenes the great weight of authority throughout the various states of the Union. The Supreme Court of Wisconsin, after it had reviewed the decisions varying on the question of liability of a charitable institution for negligence of an agent or servant, says:

"The authorities in this country almost uniformly hold that, in the absence of any negligence in their selection, charitable hospitals are not liable to their patients for the torts of their employees."

That language is found in the case of Morrison vs. Henke, decided by the Supreme Court of Wisconsin December 5, 1916, and reported in 160 N. W., page 173. In deciding the question of a charitable hospital's liability for injury to a patient through the negligence of an agent, nurse or employee, the court says:

"Since the hospital derives no profit from its work, and since it is founded for the sole purpose of conserving the health and life of all who may need its aid, and since it ministers to those who cannot pay as well as those who can, thus acting as a good Samaritan, justice and sound public policy alike dictate that it should be exempt from the liability attaching to masters whose only aim is to engage in enterprises of profit or of self-interest. The patient who accepts the services of such an institution, if injured therein by the negligence of an employee, must be content to look for redress to such employee alone."

We have now seen what the Supreme Court of the sister state on the east has said concerning this

question; now let us look to the Supreme Court of the state to the south, namely, Iowa. In the case of *Mikota vs. Sisters of Mercy*, decided by the Supreme Court of Iowa, June 27, 1918, and reported in 168 N. W., page 219, that tribunal says:

"We think the great weight of authority is to the effect that an institution of this kind is exempted from liability to one who comes to it and accepts the benefits of its charity, to a patient received for treatment, so far as liability is predicated on the negligence of its servants in administering the charity."

The Supreme Court of Iowa has decided this question in accordance with what it has found to be the weight of authority.

The question was presented to the Supreme Court of Minnesota in the case of *Mulliner vs. Evangelical Deaconess Hospital*, which was decided by that court January 9, 1920, 175 N. W. 699. The court finds that the defendant institution is a charitable hospital. It is stated in that opinion that this is the first time that the question was ever squarely presented to the court and that the court is free to decide the question either in favor or against the hospital. The court finds that the great weight of authority exempts the hospital from liability, but the court says:

"The precise question is not foreclosed by decisions of this court. We are free to adopt the rule which seems to us the more just."

The court then holds that a charitable hospital is liable for the injuries of a patient occasioned through the negligence of a nurse or agent the same as any other corporation that is maintained for profit and in so holding the court has used this language:

"This corporation must administer its functions through agents as any other corporation does. It harms and benefits third parties exactly as they are harmed or benefited by others. To the person injured the loss is the same as though the injury had been sustained

in a private hospital for gain. In this case, the deceased paid for the services he expected would be rendered, but this may not be a controlling fact. We do not believe that a policy of irresponsibility best subserves the beneficent purposes for which the hospital is maintained. We do not approve the public policy, which would require the widow and children of deceased rather than the corporation, to suffer the loss incurred through the fault of the corporation's employees, or, in other words, which would compel the persons damaged to contribute the amount of their loss to the purposes of even the most worthy corporation. We are of the opinion that public policy does not favor exemption from liability."

This decision, as has been intimated, is contrary to the decisions of courts of other states. Rhode Island and Alabama are the only exceptions to this rule. The Rhode Island Supreme Court rendered its decision in the case of *Glavin vs. Rhode Island*, 12 R. I. 411. At the very next session of the legislature following the *Glavin* decision the legislature passed a law completely and entirely abrogating the force of that decision. The law as enacted and which now stands as the law of Rhode Island, is as follows:

"No hospital incorporated by the General Assembly of this State, sustained in whole or in part by charitable contributions or endowments, shall be liable for the negligence, carelessness or want of skill, or for the malicious acts of any of its officers, agents or employees in the management of, or for the care or treatment of any of the patients or inmates of such hospital."

This law may be found in the General Laws of Rhode Island, 1896, page 538.

In view of the interests of medical men in the maintenance of hospitals, and particularly charitable hospitals, and in view of the interests of the officers of the charitable hospitals of this state, steps ought to be taken to do what was done in Rhode Island, namely, the passage of a legislative act abolishing, abrogating and making null and void the force and importance of the decision in the *Mulliner vs. Evangelical Hospital* case.

THE AMERICAN ASSOCIATION FOR MEDICAL PROGRESS*

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In 1923 a group of American citizens cognizant of the fact that the medical profession has contributed much of value to humanity, and also cognizant of the fact that the widespread propaganda against the medical sciences and closely allied sciences seriously threatens the future welfare of humanity, effected an organization known as The Friends of Medical Progress. This organization, effected in Boston, was a Lay Society with the following objects:

1. To encourage and aid all research and humane experimentation for the advancement of medical science;
2. To inform the public of the truth concerning the value of scientific medicine to humanity and to animals;
3. To resist the efforts of the ignorant or fanatical persons or societies constantly urging legislation dangerous to the health and well-being of the American people.

Among the officers of this society were Charles W. Eliot, President Emeritus of Harvard University; Charles Evans Hughes, Chief Justice of the United States; Dr. Ellen F. Pendleton, President of Wellesley College; and Dr. James Angell, President of Yale University. The work of this organization progressed splendidly and later its name was changed to the American Association for Medical Progress. The permanent headquarters of this Association are 370 Seventh Ave., New York City. It already enjoys a membership of more than 2,000, consisting of prominent business men, non-medical scientists of repute, college and university professors, college and university presidents, etc.

The American Association for Medical Progress has called attention to the fact that an "Anti-medical campaign is being conducted by a considerable number of organizations professing various aims, such as Anti-vivisection, Anti-vaccination and Medical liberty, but all seeking by fair means or foul to bring into disrepute scientific methods of combating disease and to substitute therefor every

known form of pseudo-science and quackery." They have pointed out further that "all these societies base their claims to support on propositions which are wholly or largely false. The anti-vivisectionists for instance tell us that they exist for the purpose of saving animals from unspeakable and ruthless torture at the hands of heartless doctors who conduct experiments which never have been, and which never can be, of any benefit. As a matter of fact, the anti-vivisectionists might disband tomorrow and not a single animal on this earth would miss them, for complete investigation shows that no animals are ruthlessly tortured in the laboratories. Whatever reason there may have been for the existence of such societies before the discovery of anesthetics, today their status is that of a public nuisance and a serious menace to society."

Four times within the last three years—twice in California, once in Colorado and once in Minnesota—determined efforts have been made by these people to secure legislation providing for the total abolition of animal experimentation in the states mentioned. "After long and bitter fights, with the expenditure of much time and effort, the dangerous bills were defeated. Had they been passed, the seriousness of the situation can hardly be exaggerated. If in any state such a bill should become a law, every research laboratory would be closed, bringing to an end all the investigations looking to the cure of cancer, infantile paralysis, influenza, scarlet fever, whooping cough, and many other diseases. No smallpox vaccine could be made in that state, and unless fresh vaccine could be brought in from outside, first the children, and eventually the whole population, would be exposed to one of the most terrifying and deadly scourges known to man. If there were an outbreak of diphtheria in that state thousands of children would die as they used to die before the days of antitoxin, unless relief came from some other state where no such law was in force. The outlook for farm animals would be just as bad. If there were an epidemic of hog cholera, it would be impossible to check it unless hog cholera serum, the only known preventive, could be procured outside the limits of the state. In short, not only would medical progress be completely halted, but the hands of the physicians and veterinarians and boards of health would be tied, and in default of outside assistance many diseases would run their fatal

*Read before the Minnesota State Medical Association, April 27, 1925, Minneapolis.

courses unchecked, as they did in the middle ages.

Nor would the trouble end here. The success of anti-vivisection societies in one state would be used as a lever by similar societies in other states, and the medical profession might soon be crippled over a wide area, greatly lessening the chances of obtaining outside help. English physicians are already seriously hampered in their work and the recent outbreaks of smallpox in England have given stern warning of the folly of listening to fanatics. It was more than a coincidence that the most serious outbreak occurred in Gloucester, the home of the President of the British Union for the Abolition of Vivisection, where presumably his influence was the greatest."

It may seem that such conditions as prevail in England do not concern us, but the following statement quoted from a letter recently received from Dr. A. K. Fisher, in charge of Economic Investigations, U. S. Department of Agriculture, gives us a hint which we should not neglect. Dr. Fisher is an able scientist and very conservative. He says:

"During a western trip which I have just completed, in conversation with an eminent physician he informed me that, in his opinion, within the next ten or fifteen years there would be a fearful epidemic of smallpox spread over the country vastly more serious in mortality than the epidemic of influenza of 1918. The reason for this is that many municipal officers are listening to the maudlin sentiment of those opposed to animal experimentation and the use of antitoxins. Through their activities we may expect the death of many thousand innocent children."

The anti-vivisectionists have already seriously checked the progress of veterinary medicine in this country. "In 1914, when Mr. Rockefeller gave \$1,000,000 to establish in New Jersey a laboratory for the study of animal diseases, the anti-vivisectionists persuaded the Governor to veto the bill authorizing this humane work."

I believe all present will agree that the medical profession is not in a position to combat these unscrupulous individuals and organizations because the members of the medical profession are too busy fighting disease and conserving the health of the public. Another reason is clearly expressed in the following quotation:

"Granted, then, that a widespread educational program is necessary, why is it the part of the layman to see that it is undertaken? Why is this

not the business of the doctors themselves? The answer to this question can be found in past experience. Occasionally in the past public-spirited scientists and physicians have come forward and attempted to tell the public something of what scientific medicine was doing. As a result, they have been accused of 'lining their own pockets,' of trying to 'sell' their profession to the public, of having a selfish interest in the public-health measures they were forwarding. To the man who knows, such accusations carry no weight, but the average citizen does not know the actual conditions. He becomes suspicious of doctors testifying in their own behalf. But no suspicion attaches to the testimony of a society of laymen who have no possible axes to grind." Therefore, this work of encouraging the research worker, of informing the public of the truth concerning the value of scientific medicine, and of combating the efforts of ignorant and fanatical persons or societies urging legislation dangerous to the health and well-being of the human race can best be done by non-medical people knowing and teaching the truth. The American Association for Medical Progress is composed of just such a group. Already they have done much valuable work. With the close of the year 1924 they had published and distributed approximately 72,000 pamphlets on such subjects as:

How vivisection abolished yellow fever.

Vivisection and modern miracles.

Vivisection and animal welfare.

How Pasteur convinced the world.

Your child's life or the dumb animals?

Save your child from diphtheria.

Smallpox.

All of these pamphlets are not only interesting and instructive, but also are authoritatively prepared.

In addition to this splendid work the members of the American Association for Medical Progress have entered into legislative activity. They have laid plans for the hearings on bills dealing with anti-vivisection and anti-vaccination before state legislatures and have been successful in having these bills defeated.

The good work which the members of the American Association for Medical Progress are doing is becoming widely recognized by the medical profession. For example, the Manchester Medical Association and the American Surgical Association voted that every member of their organizations be

assessed \$1 for membership in the Friends of Medical Progress. Then the American Medical Association, the Association of American Medical Colleges, the Ohio State Medical Association, the University of Cincinnati School of Medicine, the University of California School of Medicine and many other medical organizations have done much to aid and encourage the American Association for Medical Progress.

Obviously such an association would be in great need of an Advisory Medical Board. Nothing need be said further about the reliability of the information furnished this Association when one knows that the following physicians constitute the Medical Advisory Board:

W. W. Keen, Chairman; Charles C. Bass, Montrose T. Burrows, Walter B. Cannon, Charles P. Emerson, Simon Flexner, Wilfred T. Grenfell, William J. Mayo, George W. McCoy, Henry Sewell, H. Gideon Wells, George H. Whipple, David Stuart White and Ray Lyman Wilbur.

The possibilities of the American Association for Medical Progress for doing good were early recognized by the citizens of many states and municipalities, who requested that branch associations be organized. Already several such branches are

in existence. It is hoped that before long branches will be organized in the larger cities of Minnesota and that ultimately we may be able to effect a state organization working in close co-operation with the national Association. Such an organization would be capable of doing much to promote advancement of medical and closely allied sciences, to inform and keep informed the public concerning the high value of scientific medicine to humanity, and to advance through legislation those measures destined to add to the health and well-being of the American people. Until such branch organizations are made possible in our cities and state the National Association will do all in its power to help us. Therefore, I believe every physician in our state should lend his support to the development of a Minnesota Society for Medical Progress, to be composed largely of laymen and controlled entirely by laymen. Such a society would not only get the co-operation of the American Association for Medical Progress, and through it of similar groups in other states, but also would do its share toward making America safe for science and intelligence. Moreover, it would aid materially in many instances in the substitution of happiness for sorrow in the greatest of all American institutions—the home.

BENZYL-VIBURNUM COMPOUND NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Benzyl-Viburnum Compound (Benzyl-Viburnum Laboratory, Washington, D. C.) is marketed in the form of capsules. Each capsule is stated to contain 2 grains of benzyl succinate, viburnum opulus and helonin and powdered ginger root. The name "helonin" has been applied to an extractive preparation derived from false unicorn (*Helonias dioica*) of indefinite composition. Benzyl-Viburnum Compound is proposed for the treatment of dysmenorrhea and "true asthma." Benzyl esters have been found to be without value in asthma. Cramp bark (*Viburnum opulus*) and false unicorn (*Helonias dioica*) have long been constituents of proprietary "female" remedies, but there is no evidence of their efficiency. The trade package contains recommendations for the use of the preparation in painful menstruation and the advertising suggests that the bottle of the capsules may be carried in the shopping bag. The Council concludes that Benzyl-Viburnum Compound is an indefinite complex and irrational mixture, which is marketed with unwarranted therapeutic claims and in a way to encourage its indiscriminate and harmful use by the public.

(*Jour. A. M. A., Aug. 22, 1925, p. 628.*)

LONG ISLAND JOURNAL ADOPTS COUNCIL STANDARDS

Slowly but surely the work of the Council on Pharmacy and Chemistry is receiving recognition. The resolution endorsing the Council's work signed by every member of the house of delegates at the 1916 session is only the official record of the increasing support and encouragement being given by individual members of the profession. Practically every medical journal of standing refuses today to accept advertisements of pharmaceutical preparations that have not met the Council's requirement. This standard has been adopted by all of the official organs of the various state medical associations (with the notable exception of the Illinois Medical Journal). The difficulty of financing a strictly professional journal is no doubt in a great measure responsible for the failure of some publications to close their advertising columns to any but Council accepted pharmaceutical products. That the best of these journals desire to support the Council is shown by a letter from the business manager of the Long Island Medical Journal announcing the arrival of the hopefully anticipated time when this publication can afford to solicit advertising only from manufacturers of products that meet the Council's requirements. Henceforth, only such pharmaceutical products as are accepted for inclusion in New and Non-official Remedies will be advertised in the Long Island publication.

(*Jour. A. M. A., Aug. 29, 1925, p. 681.*)

BONE TUMORS*

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The recognition of the presence of a lesion of the bone immediately raises the question of benignancy or malignancy. Further, the exclusion of inflammatory lesions which may simulate tumor and the differentiation of the local and general skeletal involvement, metastasis and location of primary tumors, presents interesting problems. While the experienced roentgenologist may correctly diagnose the majority of bone tumors, there are certain of such tumors that defy recognition, and careful history taking, clinical and laboratory examinations, and even surgical explorations, are necessary to determine their true nature. The age, sex, trauma history, origin, site, size in, or invasion through, osseous and periosteal tissues, osteoclastic and osteoblastic character of, and condition of the cancellous bone cortex and periosteum, are all factors worthy of consideration in determining diagnosis, prognosis and treatment. The operability of the tumor is dependent on its local or general character; whether benign or malignant it may be of a type, size, or situation that will prevent surgical relief. The use of radium and x-ray has become valuable in the treatment of certain types of tumors, independently, in combination, or preoperatively and postoperatively. The roentgenographic examination of the chest is especially important in cases of malignant tumors, as it gives the earliest evidence of metastasis to the lung, a procedure which should be a routine before operation even in suspected cases.

The nomenclature of tumors of the bone has been confused by physician, surgeon, and pathologist, so that it has been difficult at times to understand clearly the exact meaning of myeloma, giant-cell sarcoma, giant-cell tumor, and so forth. To divide the osseous tumors into benign and malignant groups, with possibly a borderline group of inflammatory origin, would seem feasible. The term sarcoma should be confined to malignant tumors; thus, giant-cell tumors denoting the group of tumors more commonly regarded by surgeons and pathologists as benign, but formerly called

giant-cell sarcoma. The terms, central sarcoma and periosteal sarcoma, have been in common use, but the terms should be descriptive only.

The illustrative cases presented and discussed briefly here are as follows: benign cases, exostosis, chondroma, osteitis fibrosa cystica, and giant-cell tumor; and malignant cases, sarcoma, endothelioma, and multiple myelomas.

CASE 1. *Exostosis of the femur.*—A housewife, aged twenty-one, came for consultation February 15, 1916, because of the presence for ten years of a tumor on the inner side of the right femur just above the knee-joint. The tumor had caused little or no pain, unless it was injured. It had increased slowly in size until it interfered with walking; the leg tired easily. There has been a gain in weight.

Examination disclosed a large, bony mass, on the inner aspect of the right femur, apparently arising from the lower end of the diaphysis. There was no particular tenderness,

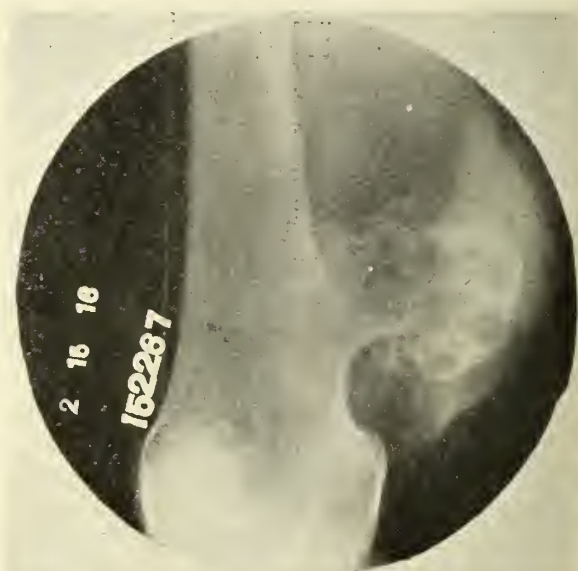


Fig. 1. Exostosis of the femur.

nor were the superficial veins engorged. There was no atrophy in the leg, but it was 7.5 cm. larger in circumference than the left leg. There was slight tenderness over the left sacro-iliac joint. The tonsils were enlarged, but not definitely infected. Examination of the blood, the urinalysis, and other findings were negative. The x-ray diagnosis was a large exostosis on the inner aspect of the right femur (Fig. 1).

The patient was operated on February 17. The exostosis was chiseled off, the base cauterized, and a rubber tissue drain inserted. She was dismissed from the hospital on the seventh day.

The patient returned to the clinic with another complaint in 1919. She was examined and there was no evidence of recurrence of the growth, and she had had no further difficulty since.

Comment.—These circumscribed, irregular tumors present a great variety of shapes; they arise from wide or

*Read before the Minnesota State Medical Association, Minneapolis, April 28, 1925.

pedunculated bases from the surface of the bone; their cancellous structure may extend into that of the bone itself and present varied amounts of cartilage over the surface, giving rise, as in this case, to a somewhat cauliflower-like growth. They may result from trauma, or inflammation; they may be multiple or symmetric; they are sometimes hereditary. In the symmetric types deformity of the extremities may result from disturbances of growth. The tumors usually arise near the ends of the long bones, although the scapula, spine, and skull may be affected. They occur in the young, usually grow slowly, although there may be rapid growth following injury. An overlying bursa, if irritated, may enlarge suddenly, and a diagnosis of sarcoma is sometimes erroneously made in such cases. If the tumors do not inconvenience the patient from pressure, or limitation of motion, surgery may be deferred. In this case ten years had elapsed since onset, then mechanical difficulties arose sufficient to warrant removal of the tumor. Roentgenograms disclosed a pedunculated tumor, penetrated by a bulbous, cauliflower-like head into the

ment of the periosteum or perforation into the soft tissues, apparently a multilocular trabeculated cystic area (Fig. 2). A tumor, cyst or Brodie's abscess was diagnosed, and exploration under tourniquet advised.

At operation, a multiple lobulated cartilaginous mass was found to involve the condyles. There was also a cystic cavity 2.5 cm. in diameter. The diseased area was curetted thoroughly. The pathologist's diagnosis was chondroma. The patient was dismissed on the twelfth day following operation.

The patient returned about two years later. For about a year he had been completely relieved. There was now pain over the inner side of the right knee, similar to that before operation, which troubled him only at night.

Examination did not reveal swelling or limitation of motion. A small bony mass could be felt in the scar 7.5 cm. above the condyle, and there was local tenderness. The urine and blood were normal. Roentgenograms disclosed a small cystic area in the internal condyle, and a strip of periosteum that apparently resulted in a small exostosis. Roentgenograms of the chest were negative.

February 4, 1922, an incision was made through the old scar, and a small exostosis removed and the area of previous operation explored. A small area, 1.25 cm. in diameter, containing cartilage, was found. The remaining area, which had occupied a large portion of the condyle, had filled in with new bone. The patient was dismissed on the sixth day. There has been no recurrence.

Comment.—Chondroma of this type is usually composed of hyaline cartilage supported on a fine framework of connective tissue. It is avascular, may contain irregular bony deposits, and is single or multiple. It is supposed to arise as a result of rickets, trauma, displaced embryonal rests, syphilis, or a transition of connective tissue cells. The symptoms vary according to the situation, size, and the condition of the substance of the tumor. It is likely to degenerate in the later stages, and not infrequently, if large, is covered by a superimposed bursa. Aching pain and occasionally tenderness are complained of, especially if pressure is made on nerves and blood vessels. Fracture may occur. Local heat in the area of the tumor is rare, and there is usually an absence of venous engorgement, which so commonly occurs with malignant tumors. Pulsation is absent. Roentgenograms do not always show characteristic findings, and the lesion may simulate fibrocystic disease or giant-cell tumor, or, more rarely, malignant bone tumor following infection. While the roentgenogram does not always determine the diagnosis, it establishes the site and extent, and differentiates the single and multiple types.

I have previously reported² the case of a patient, aged fifty-three, who had a tumor in a similar location, in which a diagnosis of sarcoma had been made from the roentgenogram, and amputation of the hip-joint advised. This patient was treated by exploration and curettage in August, 1916, and is still walking on the leg without definite evidence of further trouble, almost nine years after operation. This patient's symptoms antedated operation by seven years, which gives an idea of the slow growth of these tumors at times. The local symptoms in this case were rheumatism and lameness in the left knee, without



Fig. 2. Chondroma and cyst in the condyles of the femur.

periosteal tissues, the mottled appearance being due to irregular growth and cartilage.

CASE 2. Chondroma of the femur.—A farmer, aged thirty-two, came to the clinic in February, 1918, complaining of a dull pain in the right knee and occasionally in the left, for the last two years. He had continued work up to the time of examination, and thought his condition was probably due to rheumatism.

Examination revealed slight tenderness over the inner side of the right knee, and slight limitation of flexion. There was slight tenderness on firm pressure over the internal condyle. The tonsils were enlarged and septic; the urinalysis and the Wassermann reaction were negative; the hemoglobin was 80 per cent. Roentgenograms showed cystic areas in the epiphysis of the femur, without involve-

limitation of motion, deformity or tenderness. Thorough removal of the tumor whenever possible should be sufficient.

CASE 3. *Osteitis fibrosa cystica of the humerus.*—A boy, aged twelve, came to the clinic for examination in July, 1919, because of aching pain and swelling in the upper third of the left humerus. The arm had been severely injured eight years before, possibly fractured. Two months



Fig. 3. Osteitis fibrosa cystica of the humerus.

before examination, it had been traumatized. The arm was freely movable, and without pain or tenderness; a thickening of the upper third of the humerus was apparent. The parents and the child were greatly alarmed because cancer of the bone had been diagnosed and a Berger amputation of the shoulder advised.

A diagnosis of fibrocystic disease was made from the clinical and roentgenographic evidence, and a conservative operation advised (Fig. 3). The thin shell of cortex was broken through and a specimen removed which verified the diagnosis; following this the wound was thoroughly curetted and closed without drainage. The pathologist diagnosed osteitis fibrosa cystica. Subsequent roentgenograms showed a rapid filling in of the curetted area by new bone, so that the function shortly after operation returned to normal. The patient is living and well, with perfect use of the arm practically seven years after operation.

Comment.—These cysts usually occur in the young; they grow slowly and cause enlargement and softening of bone of the femur, humerus, tibia, and the proximal ends of the diaphysis. Roentgenograms are fairly characteristic, and in most cases diagnostic. The tumors rarely involve the epiphysis; they expand the cortex and periosteum and are trabeculated. Pain is rheumatic in character. Symptoms may be ushered in by fracture. The etiology is unknown, although infection and trauma are considered. The disease may occur in local and general forms, and therefore roentgenograms of the long bones should be made to exclude this type. Thorough curettage and crushing in of a portion of the thin wall, and resuturing the peri-

osteum, appear to be a radical form of treatment in localized forms. Watchful waiting frequently requires splinting and prolonged observation, without the certainty of diagnosing the true character of the tumor. It involves an economic problem, as well as anxiety on the part of the patient and relatives. The period of hospitalization in this case was five days, the patient returning home on the fourteenth day.

CASE 4. *Giant-cell tumor of the femur.*—The patient, a domestic, aged twenty-two, came for consultation October 6, 1917, complaining of stiffness in the left knee. Five months previously, she had noticed soreness, then stiffness in the left knee. A diagnosis of sarcoma had been made, and she had received some form of injection treatment. The tumor continued to enlarge and disability increased.

Examination showed that the patient was 5 pounds underweight. The systolic blood pressure was 130, the diastolic 80, and the pulse rate 69. The Wassermann reaction, urinalysis, and roentgenograms of the chest were negative. A diagnosis of sarcoma was made from the roentgenogram of the leg (Fig. 4). The clinical diagnosis was sarcoma. The surgeon's diagnosis was tumor, and he advised exploration, excision of the tumor, and radium.

Operation was performed October 8, and a specimen of tissue was diagnosed giant-cell tumor. The tumor had invaded the inner condyle and extended to the shaft. The tissue was reddish and jam-like. The tissue was thoroughly curetted out, the actual cautery used, and a gauze pack and rubber tissue drain inserted. Fifty milligrams of radium was left in the wound for twenty-four hours.

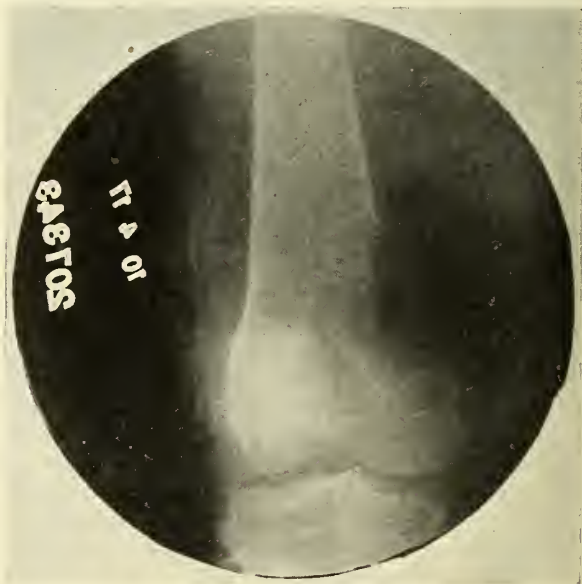


Fig. 4. Giant-cell tumor of the femur.

November 2, the patient was given 50 mg. of radium for fifteen hours, making a total of 1,750 mg. hours. The patient was dismissed on the twenty-sixth day. She continues in good health, and there has been no recurrence of the tumor. She has married, and has a family.

Comment.—This case illustrates the value of exploration under tourniquet and the opinion of a competent pathologist before subjecting the patient to amputation. The roentgenogram and clinical diagnosis of sarcoma, would, of course, have given a hopeless prognosis following a palliative amputation. The history of symptoms was short, and the growth somewhat rapid; it is very doubtful whether this tumor could have been diagnosed from the roentgenogram, or clinical findings alone. Treatment by roentgen ray might have relieved the condition, although the period of disability, twenty-six days, and the complete recovery would indicate that surgery was the rational treatment. Without exploration and operation, a positive diagnosis and prognosis could not have been made.

I have previously reported^{4,5} the roentgen-ray findings in a series of twenty-four cases of benign tumors of the bone, in which operation was performed and specimens studied. The patients have remained well for from two to fifteen years after operation, without evidence of metastasis. The average duration of the tumor before operation had been twenty months.

The treatment in such cases should be as conservative as possible, the ultimate function and economic condition of the patient being duly considered. Some of these tumors are so large and so close to weight-bearing joints that conservative surgery or treatment by roentgen ray is contraindicated; the uncertainty of the result, the disability, pain and the economic condition of the patient, may warrant amputation and the use of an artificial limb. This should, however, not be misconstrued to mean that all tumors around large joints should be amputated, but only when extreme destruction has taken place. The prognosis is good as regards life. These tumors may possibly be inflammatory in origin. They grow slowly, and cause few clinical symptoms. They have been described as a result of low grade inflammatory processes and trauma. The descriptive term "benign foreign-body giant-cell tumor" should be applied to these lesions.

In another case, described elsewhere,⁷ a patient was operated on for a giant-cell tumor of the femur, which had been diagnosed elsewhere as sarcoma. It recurred, and was again diagnosed elsewhere as sarcoma. The patient returned and was operated on the second time, nine months after the first operation, and radium applied. Tissue removed at both operations failed to show malignancy. The patient has now been well approximately three years without evidence of further recurrence.

CASE 5. Osteogenic sarcoma of the tibia.—A schoolgirl, aged thirteen, was brought to the clinic June 11, 1923, because of painless swelling of the left tibia. She had been injured twelve months, and nine months before in the region of the growth. Swelling was noticed immediately after the second injury, and this had increased.

The examination was entirely negative, with the exception of a tumor that was firm and fixed to the lower half of the tibia. The roentgen-ray, clinical and surgical diagnoses were sarcoma of the left tibia (Fig. 5).

June 15, 1923, amputation was performed through the lower third of the left femur. Roentgen-ray treatment was advised. The pathologist reported subperiosteal osteochondrosarcoma. The subsequent history was uneventful, and

the stump healed by primary intention. Roentgen-ray treatment is being carried out, while the patient walks with an artificial limb.

Comment.—That amputation may successfully remove the local condition has been demonstrated; metastasis must be prevented or cure cannot be expected. The x-ray gives the earliest evidence of metastasis to the lung, and may eventually be instrumental in its prevention, or the cure of metastatic growths. Medication thus far has failed to influence results, although toxins have been reported of benefit. The five-year cures in cases of carcinoma and epithelioma increased greatly as a result of publicity leading to early diagnosis, radical surgery, and postoperative and preoperative therapeutic measures. Future efforts

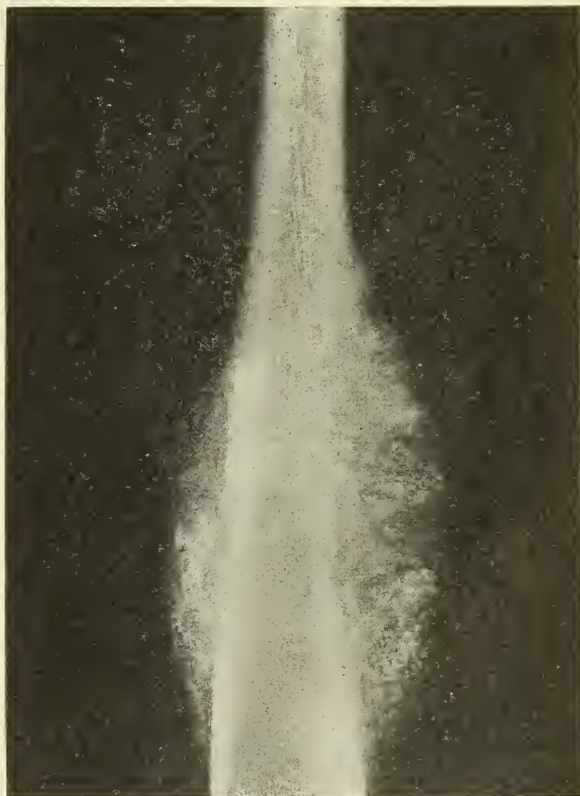


Fig. 5. Sarcoma of the tibia.

along these lines may give equally good results in cases of sarcoma of the bones.

Of a series of 470 cases of sarcoma of the extremities examined at the Mayo Clinic 35 per cent were of the bone. The most common sites are in the lower end of the femur, upper end of the tibia, and upper end of the humerus. Trauma to the site of the lesion is given as an etiologic factor in more than 50 per cent of the cases in the clinic. Seventy-eight per cent occurred in the long bones at the knee. The ages of 75 per cent of the patients were between ten and forty years. Dull pain, tumor of slow or rapid growth, and varying in tenderness, are common early symptoms. Later, there are superficial venous enlargement, local heat, discoloration, joint stiffness, and pathologic fracture,

anemia, loss of weight, disability, and finally cough, which is always suggestive of metastasis. I have previously discussed the distribution, relation of trauma to type of cell found, relation of cell to age, relation of age to location, relation of type of cell to duration of symptoms before and after operation with life expectancy and end results in 109 cases, and, also, the value of the x-ray in diagnosis and the types roentgenographically met with in a series of several hundred sarcomas.

This child is up and around apparently well and happy almost two years after amputation. An attempt to control the tumor in this case by less radical measures would not have been reasonable. Osteogenic sarcomas are very malignant; they produce metastasis, and the prognosis is always grave. I have eradicated the local growth and attempted to control metastasis through radiotherapy.

CASE 6. Endothelioma of humerus.—The patient, a university student, aged twenty-three, came to the clinic November 1, 1920, because of painful swelling in the right shoulder. He had injured the shoulder in November, 1918, and again in March, 1920, eight months before his examination here. Following the second injury, the shoulder remained painful and slightly stiff, and following x-ray examination treatment had been given for impacted fracture. The presence of a tumor, probably sarcoma, was suspected, and operation advised. There had been several consultations with regard to the advisability of amputation.

The right shoulder in the upper third was found to be enlarged, due to a tumorous growth which was fairly firm and apparently arising from the humerus. There was limitation of motion and of function of the shoulder and arm. The roentgenologic diagnosis was sarcoma of the humerus (Fig. 6). Roentgenograms of the chest were negative for metastasis. A four-quarter amputation was advised and agreed to by the patient.

December 3, 1920, the soft, vascular tumor was explored and curetted out. The pathologist reported round-cell sarcoma. It was believed advisable to attempt to save the extremity inasmuch as round-cell sarcomas are more amenable to radiotherapy. The tumor was removed as completely as possible, and the wound packed with gauze. Radium was used in the wound as the pack was removed, and in the skin over the tumor area, while x-rays were applied over the chest by the cross-fire method. The patient co-operated well and returned at regular intervals for observation. A discharging sinus persisted. He gained weight rapidly. A dermatitis developed about the wound, the result of the irritating discharge and radiation; this, however, was not serious.

August 22, 1922, a sequestrum was removed from the right humerus. May 15, 1923, a pathologic fracture occurred, and tissue removed at this time was reported to be mixed-cell sarcoma. August 22, nonunion persisting, a disarticulation was performed at the shoulder, with complete removal of the deltoid muscle. The humeral head and the deltoid muscle at its origin were involved. The pathologist reported mixed-cell sarcoma of perithelial arrangement. The total amount of radium used in this case was 58,716 mg. hours, from December, 1920, to May, 1922. Roentgenograms of the chest were negative. The patient has remained well, has gained in weight, and is attending college.

Comment.—This university student, with a definite history of injury and fracture, had been observed by an excellent surgeon, who suspected sarcoma. Even though amputation had been advised, it seemed desirable to attempt to save the arm, especially as round-celled sarcomas, which have been described as endotheliomas, appear to react more favorably to radium and x-ray treatment than osteogenic sarcomas. There was a temporary beneficial reaction to



Fig. 6. Endothelioma of the humerus.

radiotherapy; however, amputation proved the presence of malignant bone and muscle. These endotheliomas appear to be osteoclastic. They spread over the shaft of the long bones to a considerable extent, and produce bulging and striations. They may be single or multiple, and may simulate metastatic carcinoma of the breast, and multiple myelomas. They are more likely to involve the shaft rather than the ends of the bones, as is the case in sarcoma, and the outlines are less sharply defined in the areas of bone destruction than in the osteoclastic forms of sarcoma, as observed roentgenographically. They tend to metastasize and are usually fatal.

CASE 7. Multiple myelomas.—A man, aged fifty-five, came to the clinic October 20, 1922, complaining of double vision. Four months before, he had noticed a small lump on the top of his head, which slowly increased in size. Two weeks before, he suddenly had double vision, and complained of neurotic pains in the arms and chest. His general health otherwise was good. He thought that an abscessed tooth which had been removed about two months before was responsible for the pain.

Examination disclosed a soft tumor on the left posterior parietal region, the edge of the bone being plainly palpable. Examination of the eyes revealed vision, right 6/30, left 6/30, with correction 6/5, reflexes normal, fundi normal and fields normal. The x-ray showed an area of destruction in the left parietal, frontal, and occipital bones (Fig. 7). The right clavicle, right second rib and left first rib were apparently involved. There was no evi-

dence of spinal or pelvic involvement. Roentgenograms of the lungs were negative. There was pain, however, and tenderness over the left lower ribs posteriorly. Two samples of urine showed a specific gravity of 1.027 and 1.034. The reaction was acid, there was considerable albumin and an occasional hyalin cast, and the Bence-Jones test was negative on both occasions. The hemoglobin was 75 per cent; the Wassermann test was negative.

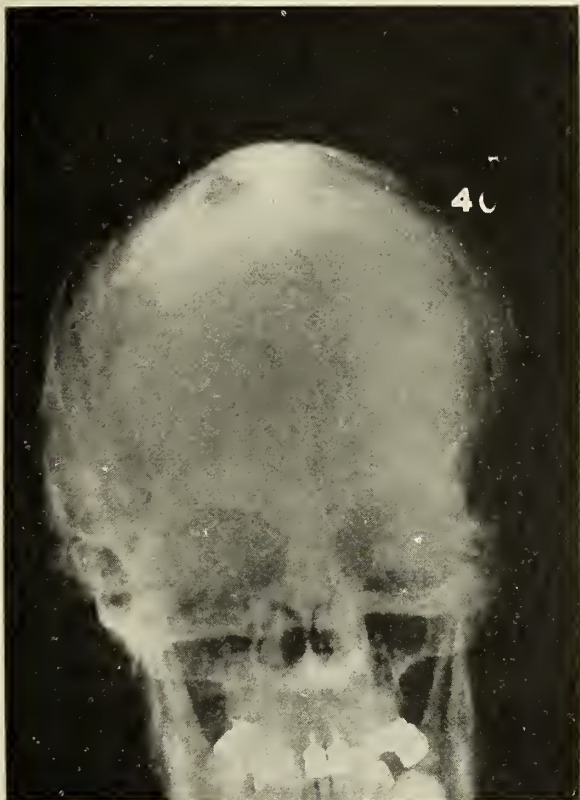


Fig. 7. Multiple myelomas of the skull.

A diagnosis of multiple myeloma was made and the patient was referred home with an unfavorable prognosis, where he died May 17, 1923. Necropsy disclosed multiple myelomas involving the skull, ribs, and right clavicle. There was marked emaciation, arteriosclerosis, hypostatic edema and congestion of the lungs, and old healed tuberculous pleurisy and lymphadenitis.

Comment.—Multiple myelomas rarely occur. They are characterized by multiple tumors of the bone marrow and are more common in males than in females. Patients are usually from forty to sixty years of age. The roentgenogram may show one or many rarefied circular or ovoid osteoclastic areas in the soft bone; later there is absorption and involvement of periosteal structures. The presence of large quantities of albumin in otherwise normal urine should suggest the possibility of multiple myelomas, especially if there has been a complaint of lumbago, chest pains, neuritis or rheumatism. When the disease affects the spine and remains localized it may simulate tuberculosis, and there have been cases in which bone-graft operations have been performed on this diagnosis.⁸ Deformity of bone and fracture may develop. Soft tender masses of the sternum, ribs and clavicle are not uncommonly palpable. I have previously reported⁶ fourteen cases of this disease in which the youngest patient was forty-three years, the oldest sixty-nine, the average age being forty-nine plus. Nine were females and four were males. Remissions of symptoms may occur. The prognosis is poor. The patient may live from a few months to five years.

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ANOTHER MAIL-ORDER REJUVENATING CONCERN DECLARED A FRAUD

For two or three years past a mail-order concern calling itself the "Melton Laboratories, Manufacturing Chemists," has been defrauding the public from Kansas City, Mo., in the sale of an alleged sex rejuvenator. The "Melton Laboratories" were not laboratories, and the "manufacturing chemists" were neither chemists nor manufacturers. The thing was a crude mail-order swindle operated chiefly by Harold Nelson Stunz. The nostrum put out by the Melton Laboratories was called "Korex." Later, Stunz had two

additional drugs added to Korex and put it out under the name "Hiobin," and created a paper organization called the "Hiobin Co." Then Stunz brought out a "Kidney Cure" that he called "Renex." This was sold by the Renex Co., another "paper concern." All three of these nostrums came from the same address; but the public had no means of knowing this, as the addresses were camouflaged to cover this fact. On August 13, 1924, the Melton Laboratories (H. M. Stunz, manager), the Hiobin Co., and the Renex Co. had a fraud order issued against them debaring them from the use of the mails.

(*Jour. A. M. A.*, Aug. 29, 1925, p. 694.)

THE TREATMENT OF ACUTE APPENDICITIS*

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The mortality rate of acute appendicitis is too high. Statistics from our best hospitals show a mortality rate of 5 to 10 per cent.

The late John B. Murphy stated, "It can be laid down as a rule that the case of acute appendicitis coming to operation with pus outside the walls of the appendix has not been properly treated up to that time."

In addition to the unwarranted high mortality rate, there is a high morbidity, such as prolonged drainage, fecal fistulæ, adhesions, liver infections and other complications from failure in prompt treatment. Prompt treatment of appendicitis is without mortality.

Ochsner, in a personal communication in June, 1924, states, "I have had no deaths in cases which have been operated upon in the first twenty-four hours in which cathartics or food have not been given prior to operation."

The death rate of 5 to 10 per cent in our leading hospitals is proof that there is something radically wrong. The cause of this high death rate and high morbidity is late diagnosis and delayed operation. There are two reasons for this delay. First, the widespread practice among the laity in taking cathartics without medical advice as soon as they feel any abdominal pain, believing that free evacuation of the bowels will stop their symptoms. In many cases, a physician is not called until a spreading peritonitis places the patient beyond help by any treatment. In the second place, many of the general practitioners are in the habit of temporizing with acute appendicitis with the expectation that an opiate and a cathartic will relieve their symptoms, and waiting until irreparable damage has been done. Many cases of acute appendicitis have perforated in the first twelve hours.

Diagnosis in the average case is easy. Many cases in the beginning show few characteristic symptoms. Many physicians hesitate to diagnose acute appendicitis in the absence of fever and increased pulse rate. Many cases of acute appendicitis proceed to gangrene and perforation without elevation of temperature or pulse rate.

Every case of acute appendicitis should be submitted to operation as soon as possible in the first forty-eight hours. No case should have food or fluids by mouth after the onset of acute symptoms.

There is much difference of opinion regarding the method of procedure after forty-eight hours have passed. One group, headed by Ochsner, who has many supporters, believe in the conservative treatment after the forty-eight-hour period has passed, and advocate opiates and the administration of fluids by every method to prevent dehydration. The other group advocate operation at any time as soon as the diagnosis is made. Comparing results and statistics from clinics where both methods are used, I believe that the advocates of the Ochsner treatment show better results.

It cannot be stated dogmatically that no case should be operated upon after the lapse of forty-eight hours. As a general rule, more lives will be saved by conservative treatment—following the Ochsner plan after forty-eight hours have passed—in the group of cases referred to by the late Maurice Richardson as "too late for early operation and too early for late operation."

A certain percentage of the cases coming too late for early operation may need surgical relief in the form of drainage or enterostomy. A certain group can be operated upon with relatively small risk even after the forty-eight-hour period, depending upon the skill and diagnostic ability of the individual operator.

In our work from 1904 to 1917, about 700 acute cases were seen, of which 362 were operated upon in the first forty-eight hours with no fatalities. These cases showed all degrees of pathology from the acute catarrhal stage to gangrene, perforation and local peritonitis. In several of these cases where distension and vomiting persisted to a threatening degree, in spite of frequent enemata and gastric lavage, enterostomy was performed under local anesthesia. In one case, three enterostomies were performed on the same patient.

In the group coming under observation after forty-eight hours had passed were approximately 350 cases. Most of these had received food and cathartics. Many had received opiates from their medical advisor. Seven of these, or approximately 2 per cent, were moribund on admission. In several of these late cases, simple drainage was instituted, and in several others enterostomy was performed with gratifying results.

*Presented before the annual meeting of the Minnesota State Medical Association, Minneapolis, April, 1925.

One in this late group, a boy of twelve, came to the hospital giving a history of six days of acute abdominal pain following tonsillitis. He had extreme abdominal distension, but did not respond to enemata and gastric lavage and his general condition was poor. Enterostomy was done under local anesthesia and he made a nice recovery. Two years later, he returned in a similar condition, too sick to stand any radical operation, and enterostomy again relieved his symptoms.

Concerning the advisability of operation after the first forty-eight hours have passed, there is one group of cases which we never operate upon until four to six weeks after the disappearance of acute symptoms. I refer to the localized abscess in the patient who is doing apparently well. I have seen several of these patients operated upon in the acute stage. The mortality rate was large. In many cases, the appendix could not be removed. Where the appendix was removed and a large number of drainage tubes used, many had subsequent trouble from adhesions. The localized abscess in the group referred to, with the appropriate medical treatment, will clear up completely in most cases so that in four to six weeks a clean, safe, easy operation can be performed without drainage and, as a rule, without any postoperative sequelæ.

The next group of cases coming after the forty-eight-hour period has elapsed are the individuals that have had a comparatively mild attack and are doing fairly well, and we find no clinical signs of perforation or localized abscess. These patients can be operated upon safely and should be operated upon.

In five of our patients in whom liver abscesses developed, four had a comparatively mild attack of appendicitis without perforation and were apparently making a nice recovery from their acute attack.

OPERATION

In our earlier work, the McBurney incision was used exclusively. In later years, the incision in the outer edge of the right rectus muscle has been employed in most cases. This offers several advantages:

1. If the appendix is high or in the pelvic position, the incision can be extended as needed.
2. In a perforated appendix in the pelvic position, the incision in the rectus muscle gives easier access to the trouble.

3. It gives a shorter drainage tract for pus in the pelvis. Pus in the pelvis is a frequent and serious complication of the perforated appendix, no matter what position the appendix occupies.

4. It allows easier application of a modified rubber-covered Mikulicz's drain placed in the pelvis so as to hold the coils of the terminal ileum out of the pelvis. It permits better strapping of the wound in cases where it is deemed better to strap the wound after the manner of MacLaren¹ instead of suturing.

As soon as the incision reaches the peritoneum the assistant holds the vacuum pump ready so that it catches the first drop of pus escaping, thus minimizing the soiling of the wound. The pump is gradually advanced to the bottom of the pelvis so that all free pus is removed without sponges. The next step is the introduction of flat Deaver retractors so as to hold the coils of the intestines out of the way, and particular care is taken that no coil of intestine is allowed to protrude. The appendix is located preferably by sight; and, if this is not possible without disturbing adhesions or manipulation of the intestines, it is located and delivered by touch. In the presence of pus, where the walls of the cecum are edematous and friable, the base of the appendix is crushed, a catgut ligature applied, and the stump of the appendix carbolized, no attempt being made to cover the stump with peritoneum.

Drainage.—It has been our practice to drain every case where a green or black spot shows on the appendix. In every case where pus is present in considerable amount, a half-inch soft rubber tube is placed to the bottom of the cul-de-sac. In all cases where considerable pus is present, no matter what the location of the appendix, there is always some pus in the pelvis. In cases where fibrinous adhesions are present in the coils of the small intestine, a modified Mikulicz's drain, rubber-covered, is placed to the bottom of the cul-de-sac in such a way as to hold the coils of the ileum out of the pelvis and away from the pelvic structures. I have found that a rubber glove packed with strips of gauze answers this purpose well.

Many of the cases were operated upon with local anesthesia supplemented in some cases with gas or ether. A few cases in children were operated upon with local anesthesia and nitrous-oxide-oxygen anesthesia.

Suture.—In our earlier cases, pus cases were sutured. In later years, after MacLaren's publication advocating strapping, we have followed this method and believe that the patient gets out of bed quicker and the wounds heal with less tendency to postoperative hernia because there is no sloughing of the fascia. The peritoneum is sutured up to the drains so that the coils of intestines cannot protrude, and the rest of the wound is strapped with adhesive strips, which are thoroughly flamed before being applied. It is remarkable how nicely and rapidly these wounds have healed in comparison with the sutured cases, where much of the fascia sloughs away. Where we use the packed rubber glove, the packing is gradually removed after the first forty-eight hours, and as soon as all the packing is removed the rubber glove can easily be removed by twisting.

Postoperative Posture.—All patients in whom pus is present are turned on the right side with knees flexed. Where we fear necrosis of the walls of the cecum, we do not use the Murphy drip, but prefer subcutaneous administration of tap water. In children it is often advisable to give a pint of water intravenously while on the table.

Our percentage of postoperative hernias in the drainage cases has been 3 per cent. These all occurred with the McBurney incision. Since adopting the right rectus incision and strapping of the wound after MacLaren's method, we have had no complaints of postoperative hernias.

At a recent visit to the clinic of Drs. Quain and Ramstad, I had the privilege of seeing several cases of acute perforated appendicitis operated upon. They are using the McBurney incision. It has been Dr. Quain's observation that the hernia following appendectomy with drainage usually starts at the linea semilunaris, and particular care is taken to reconstruct the linea semilunaris, but at the same time placing no other suture in the fascia of the external oblique.

Enterostomy.—For the last twenty years I have resorted to enterostomy many times in the treatment of peritonitis. I have been compelled to resort to this measure in several patients who were operated upon in the first forty-eight hours and in many who came in after the forty-eight-hour period, and also in peritonitis of other forms where the patient came in in such a condition that a radical operation was not warranted.

Sampson Handley² describes what he calls "ileus duplex" and argues that mechanical obstruction due to local peritonitis, causing adhesions of the terminal ileum in the pelvis is the initial stage of general peritonitis in many cases. In his early cases, he performed ileocolostomy to short circuit the obstruction. Many of his patients died. This is a severe procedure on a patient who is already in a serious condition, and I believe that timely enterostomy done with local anesthesia will tide the very ill patient over the danger point. In order to be effective, the enterostomy should be done before the obstruction has done so much damage that the distended ileum fails to respond.

This valued aid in treating peritonitis of any origin has not received the attention it merits. Dr. Cooney³ of Princeton has performed enterostomy many times at the time of removal of the appendix and with gratifying results. Dr. A. N. Collins⁴ has also used enterostomy at the first operation. So much has been written lately about the technique of enterostomy that no description of this life-saving measure is necessary.

CONCLUSION

If all cases of acute appendicitis were submitted to operation within the first twenty-four hours, we should have no deaths from appendicitis or its complications.

To reach this end, a campaign of education with our patients, warning them of the danger of giving a cathartic at the onset of any acute pain in the abdomen, is needed.

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DISCUSSION

DR. DONALD K. BACON, St. Paul: I think Dr. Bratrud's paper was exceptionally good and to almost everything he said I can subscribe without reservation, but I would like to add a few remarks on the subject of drainage. Drainage is something that when properly done is a life-saving measure, but if improperly done the patient may succumb in spite of it. (Illustrating on blackboard.) Let us assume this is the abdomen, this represents the liver, and here is the stomach. At this point (indicating) the intestine becomes retro-peritoneal around to approximately there, where the jejunum emerges. Then if we consider the mesenteric attachment, this runs obliquely down and across the abdomen to the ileocecal junction, then upward to the hepatic flexure, over to the splenic flexure and down to

the rectum. At several points here the colon is retroperitoneal. When the surface is covered with peritoneum this arrangement of the mesentery leaves very definite pathways along which infection from a perforated appendix will extend. At this point (indicating) we have the appendix. The infection would first of all tend to gravitate into the pelvis when it extends beyond the localized abscess stage. It will, secondly, extend upward to the right of the ascending colon toward the region of the right kidney and, third, it will extend into the intermesenteric region between the small intestine and the descending colon. The region between the mesentery of the small intestine, the ascending colon and the transverse colon is less frequently affected, and the same is true of the region to the left of the ascending colon. That leaves in the average case of peritonitis three regions to be drained. These are the regions in which the largest collections of pus will be found at operation, or where drainage has been neglected. In rare instances it may be necessary to put a drain across the cecum and the ascending colon into this region, and here (indicating), if the abscess has extended up into the subphrenic region. I use three drains, one to the pelvis, one to the right kidney region, and one in the intermesenteric region between the descending colon and the small intestine. Those will cover 90 per cent or better of the cases, and after the natural immunity of the patient has been fortified by plenty of water, rest and quiet for the intestines, so the infection will not spread, these drains may be slowly removed, an inch or two a day, which will give a maximum of results with a minimum of trouble.

DR. FREDERICK J. PLONDKE, St. Paul: In the cases with localized abscess which the doctor suggested should be postponed from four to six weeks, I wish to cite a case which shows the danger of allowing these cases to continue.

Some time ago a boy of about six came to the hospital after having been sick for six days. There was a mass in the right iliac region which showed localized abscess. We decided to postpone operation and watch it. On the night of the third day I was called by telephone and informed that the patient was taken suddenly with severe pain in the abdomen. When I arrived at the hospital an hour later the patient was in shock, somewhat distended, tender and complaining of severe pain all over the abdomen. The abdomen was opened at once under novocaine anesthesia; large quantities of foul-smelling pus were found free in the abdominal cavity, completely filling the pelvis. It was evident that the abscess had ruptured a short time previous, spilling its contents into the general abdominal cavity. Drains were inserted, but the boy died two days later of general peritonitis. I mention this case to show that it is not always safe to treat these cases conservatively.

Dr. Bratrud spoke of the danger of cleansing the abdomen of pus. Generally speaking, I think he is right. There are cases, however, where your better judgment seems to tell you that some effort should be made to relieve the

patient of the continued absorption, which is bound to take place if the pus is allowed to remain in the pelvis and in pockets between the coils of intestine. In such cases we place our hand in the abdomen, gently holding back the intestines, and pour ether into the pelvis, swabbing out carefully; or preferably removing with suction apparatus, repeating it several times. This literally washes out the pelvis and drains the pockets in the lower part of the abdomen. Ether is not an antiseptic, but there is no question that it has an inhibitory effect on bacteria.

Tarnowsky, of Chicago, has made some interesting reports on the use of ether in septic cases. We do not, however, agree with him that ether should be left in the abdomen without providing means of escape by way of drainage.

As to drainage: we have not yet reached the stage where we can feel positive when and when not to drain. We believe that drainage is used in many cases where it is unnecessary. Yet the present tendency to close the abdomen in most cases whether there is free pus or not, I believe is going to extreme.

In the majority of our acute cases we do an appendicostomy; this is done by placing forceps through the opening in the stump, dilating it and inserting a tube into the cecum and holding it in position by a double purse-string suture. This allows the gas to escape and often makes the enterostomy mentioned by Dr. Bratrud unnecessary.

Enterostomy is a life saver and should be done oftener and sooner. It is asking too much when we expect nature to combat infection both in and outside of the intestine; by relieving the distention and removing the toxic contents the circulation in the intestinal wall becomes re-established. This decreases the danger from absorption within the gut and must surely increase the power of resistance in its peritoneal covering.

DR. THEODOR BRATRUD, Warren (closing): Of course, there is always danger with a localized abscess, but my observation has been that the case that comes in late with a localized abscess that is doing well clinically will do better by waiting. The abscess usually absorbs. Occasionally it ruptures into the belly. In nearly all cases after four or six weeks you can go into the belly and find that every sign of abscess has disappeared and you can then do a clean operation, whereas if you operated in the presence of the pus you would very likely get hernia, adhesions, sloughing of fascia or some other bad results. Balancing the conservative treatment against the other, I think we can save more lives by conservatism. We tried the method of washing out abscesses with ether for two or three years and then we abandoned it again. So far as we could see it made no difference whether we used ether or just used the suction pump to remove the pus. I think the important thing is to avoid traumatizing the tissues. It is the abrasion of the serosa of the healthy tissues that is the start of the trouble, *i.e.*, adhesions and spread of infection.

PRODUCTION AND HEALING OF PEPTIC ULCER: AN EXPERIMENTAL STUDY*

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Williamson and I have previously reported a method for the experimental production of peptic ulcer in the dog. The characteristic peptic ulcer usually occurs in a mucosa, pyloric and duodenal, which, although secreting an alkaline secretion itself, is exposed to an acid medium. It would thus seem that the acid might be a direct or indirect factor in producing the lesion. Our results in a preliminary series of experiments in which acid was administered orally, as well as the results of previous investigators, demonstrated that simulating the so-called hyperacidity and hypersecretion by the artificial administration of acid would be very difficult. As was reported in the previous article, the degree of acidity and the amount of acid to which the ulcer-bearing area of the gastric intestinal tract is subjected depends not only on an acid-producing mechanism, but also on an alkali-producing mechanism. The acid secreted by the gastric mucosa must be neutralized before the action of the pancreatic enzymes can be effective. The neutralization not effected by the food must be effected by this alkali-producing mechanism, which consists of three secretions: the intestinal (also the secretion of the pyloric mucosa), the pancreatic juice, and the bile. Enough alkali must be produced by these combined secretions to neutralize the acid that passes the pylorus, if digestion in the intestine is to be carried out normally. The upper portion of the intestinal tract can be subjected to an acid medium just as effectively by damaging the alkali-producing mechanism as by the administration of acid. We therefore undertook to eliminate singly, and in combination, the various constituents of this mechanism, and found that the damage of any one of these constituents caused the development of a typical chronic peptic ulcer in a small percentage of experiments. We finally devised a method which consisted essentially in draining this alkaline secretion, which is poured into the duodenum, into the ileum at a considerable distance from the point of emergence of

the acid from the stomach into the intestine. Following this procedure, a typical peptic ulcer developed in a high percentage of experiments. It usually developed within a month or two after operation, and always in the jejunal mucosa just distal to the suture line, usually slightly posterior and to the right. As a rule there was only one ulcer, but sometimes there was a contact ulcer, and occasionally there were three ulcers. Generally they were relatively large and perforated the entire thickness of the jejunal wall. Grossly and microscopically the ulcers presented the same general characteristics as those in man.

After careful study of the development of the ulcers in various stages, it seemed desirable to know whether they would heal, and, if so, what the healing process would be like. Accordingly, after an ulcer had developed in certain animals, its site was explored, the character of the lesion observed, measurements were taken, and in some instances a specimen for histologic study was secured. Then the pyloric opening was occluded proximal to the ulcer to prevent the passage of gastric contents over it, and the stomach drained with a gastrojejunostomy, the stoma in the jejunum being 25 to 30 cm. distal from the ulcer. The ulcer was then examined at various periods after the operation.

Following this procedure the ulcers healed with remarkable rapidity. Within four days their bases were clean. In ten days the ulcers had usually greatly decreased in diameter and depth, and the mucosa had begun to grow in from the edges. On the twentieth day three-fourths or more of the base of an ulcer was covered with mucosa. Before the thirtieth day it was almost impossible to find the site of a lesion. An ulcer, 1.5 cm. in diameter and 0.5 cm. in depth, which had perforated the entire thickness of the jejunal wall, would almost entirely disappear within twenty-five days after protecting it from the gastric contents. The base, which was hard and indurated, became soft and thin, sometimes bulging like the wall of a diverticulum.

Closing the pylorus and draining the stomach by a gastrojejunostomy not only prevent the acid from reaching the ulcer, but place at rest the loop of intestine bearing it. In order to determine whether both procedures were necessary, in one series of experiments the duodenum was drained back into the loop bearing the ulcer. Thus both

*Read before the Minnesota State Medical Association, Minneapolis, April 27-29, 1925.

gastric and duodenal contents could pass over the ulcer. The results were variable. There was always some healing. If the lesion was so situated as to be somewhat protected after the last operation, healing was almost complete, as in the first series of experiments. If the ulcer was fully exposed to both secretions, healing was slow and irregular. These experiments seem to show that the alkalization of the gastric contents is of major importance in aiding the healing of these ulcers, but that the mechanical factor of the secretions pouring over the ulcer is also a factor of importance in preventing or retarding the healing.

The healing of the ulcer was studied both macroscopically and microscopically. Macroscopically the first evidence of healing was the disappearance of exudate and debris from the base. The ulcer appeared to grow shallow, due to a filling in of the base by new granulation tissue, which, together with the overhanging edges of mucosa, completely filled the base. Gradually the edge of mucosa grew from the periphery toward the center, usually pushing the granulated tissue up and out like a plug. At first the mucosa was thin and smooth, but it gradually thickened and was thrown into folds. The inflammation in the base subsided and the hard induration disappeared. Microscopically, the development of the granulation tissue and the growth of the mucosa and connective tissue could be closely observed. As the base of the ulcer became clean, the leukocytes disappeared, and granulation tissue developed, which was usually very vascular; it can readily be surmised that if the base of a healing ulcer is injured considerable hemorrhage might occur. Usually a thin limiting membrane of connective tissue formed over the base of the ulcer. The mucosa grew in from the edges over the surface of granulation tissue. At first the mucosa consisted of but a single layer of flat or cuboid cells on a basement membrane. Later the cells became typically columnar. Often the growing edge of mucosa was under an overhanging, protecting edge of the plug of granulation tissue in the center. As the cells of the mucosa increased in number and size, the smooth growing surface was thrown into small folds which carried the newly formed connective tissue with it. At first the folds were small and wavy, but as the mucosa grew, the typical normal villi appeared. The growing edge of mucosa was very fragile, and it can readily be seen how easily it would be de-

stroyed by the passage of the gastric contents over it. As a matter of fact, we were never sure we were studying the ultimate edge because, even with the most careful technic in preparing the specimen, it always seemed as though some of the edge were lost.

Early in the healing of an ulcer the macroscopic changes are more noticeable than the microscopic changes. While to the naked eye or under a dissecting microscope the appearance of an ulcer which has been protected from the gastric contents for a few days may be quite different from its appearance at the time of exploration, a microscopic study does not reveal such a marked change. While histologically the protected ulcer presents definite changes from the specimen removed at operation, a careful study reveals a similarity of the various processes in the two specimens. This observation revealed the fact that the healing processes were active in the ulcers at all times, but when the ulcer was unprotected from the gastric contents the newly formed cells were destroyed before they could become an integral part of the tissue.

Although we developed the method for producing the ulcer on the basis that a discrepancy between acid and alkali production might be an important factor in the production of ulcer, and although the ulcers thus produced heal very quickly when protected from the gastric contents, it must not be considered as proved that the acid factor is the only one in the etiology of these ulcers. While the gastric contents are without a doubt of major importance, other factors also are involved.

SUMMARY

A method is described for the production of a lesion in the dog which resembles in most particulars peptic ulcer in man. The essential procedure is to drain the contents of the duodenum into the ileum at a considerable distance from the point of emergence of the acid from the stomach. Following this procedure, a typical peptic ulcer developed in a high percentage of experiments; it usually developed within a month or two after operation and always in the jejunal mucosa just distal to the suture line, usually slightly posterior and to the right. If the ulcer is protected from the gastric juice coming in contact with it, healing is complete and remarkably rapid.

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DISCUSSION

DR. E. T. BELL, University of Minnesota, Minneapolis: As Dr. Mann is the first to have produced a chronic ulcer experimentally, we should be very proud that this work comes from our state. I think this is the first definite step in determining the cause of peptic ulcer.

ANTI-PHYMIN

This, modestly described as "the healing gas" and "the greatest curative agent known," is at present prepared by the Phymos Chemical Laboratories of Pensacola, Florida. It is said to be "nonpoisonous to the fullest extent"—whatever that may mean. As is common with quacks, the exploiters of Anti-Phymin have a simple explanation for the complex facts of pathology. All disease, according to the Anti-Phymin thesis, is caused by fermentation. Anti-Phymin, it is claimed, stops the fermentation—and there you are. Anti-Phymin is said to be the discovery of one Cock. In 1916, he was conducting the "Cock Camp Colony and Laboratories" at Kingsland, Texas. This was a "consumption cure" affair in which Anti-Phymin was a part of "the system of treatment." Now, Anti-Phymin is recommended for such a broad field as sore throat, pyorrhea, asthma, "disorders of the stomach," poisoning, "disorders of the kidney and liver," diseases peculiar to women and venereal diseases. It is also claimed to have cured many cases of pulmonary and bone tuberculosis and is recommended for gall-stones, pellagra, appendicitis and diabetes. The A. M. A. Chemical Laboratory examined Anti-Phymin and found it to consist of a dilute solution of sulphurous acid and, necessarily, a small amount of sulphuric acid. This shows that Anti-Phymin belongs to the class of "Liquozone," "Radam's Microbe Killer," "Oxytonic," "Septicide," "Zymatoid" and other nostrums containing, as their essential ingredient, sulphuric and sulphurous acid.

(*Jour. A. M. A., Aug. 15, 1925, p. 535.*)

THE PARATHYROID HORMONE

The recently reported studies make it more than likely that suitably prepared parathyroid extracts contain a substance or substances that will afford complete replacement therapy in the case of the totally parathyroidectomized dog. The methods thus far developed indicate that any extract of fresh ox gland that has been made by a process of weak acid hydrolysis and is sufficiently concentrated contains more or less of the active principle. It has been proposed to use as a provisional unit of potency one one-hundredth of the amount of extract that will produce an average increase of 5 mg. in the content of calcium in the blood serum of the normal dog of approximately 20 kg. of body weight over a period of 15 hours. There should be no haste in a possible human application of the parathyroid hormone. Injection of even very small amounts frequently repeated have invariably proved fatal to animals when the injections were continued.

(*Jour. A. M. A., Aug. 8, 1925, p. 441.*)

PERFORATED ULCER*

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The seriousness of the situation in case of acute perforation of the stomach or duodenum, and the wonderful opportunity to save life by an immediate operation, are reasons enough for presenting this subject for your consideration.

Harrigan¹ says, "Perforation of a gastric or duodenal ulcer is one of the gravest emergencies in abdominal surgery. Peritonitis is the inevitable sequence, unless the condition is checked by operation."

Many of our patients are going about today with stomach or duodenal ulcers, which may or may not be causing discomfort.

Spect² reviewed 3,224 ulcer cases at the Dresden Hospital, and estimated that 10 per cent are apt to develop perforation sooner or later. He also found that among the perforated cases about one-half had no history of ulcer symptoms before the perforation occurred.

A. H. Noehren³ estimated that 7 per cent of all duodenal and 20 per cent of all gastric ulcers would perforate. He also claims that he found more than one ulcer in 27 per cent of his cases.

Men are much more likely to have perforation of ulcer than women, the proportion being 3 to 1. All of our cases have occurred in men.

The diagnosis of perforation is not made by observing a large number of symptoms or signs, but the few symptoms that are present are so striking and definite that a diagnosis in the beginning is not difficult. At this stage, there are only two symptoms worthy of consideration. They are sudden, violent pain and board-like rigidity of the upper abdomen. The pain is intense, excruciating, and often described by the patient as knife-like. It is continuous; not colicky, as in intestinal colic or acute indigestion. The pain of perforation is not relieved by morphine. The patient lies in a tense, fixed position, often screaming with pain and calling for relief. After the pain begins, he usually vomits, but does his best to prevent its recurrence, for fear of aggravating his suffering. He may be in shock; cold and clammy. A severe pain coming on within a few minutes of the perforation,

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, April, 1925.

and felt in the supraclavicular fossa, usually the left, is a symptom often overlooked. It seldom lasts more than 15 minutes, and Gibson⁷ considers it almost pathognomonic.

A large proportion of perforations occur close to the pylorus, and on its anterior surface. If the perforations occur on the posterior stomach wall, the intense pain will be in the back. Perforations on the anterior gastric wall, near the cardiac end, are very rare.

After two hours, the condition gradually changes. The patient is becoming somewhat toxic from absorption. Morphine is now very effective, and the patient and his friends, and often the attending physician, think he must be better.

If the perforation is in the duodenum, its contents have gravitated down the ascending colon, to the right iliac fossa, and now, two or three hours after the perforation, the greatest tenderness and rigidity is in the region of the appendix.

If the perforation has been gastric, the stomach contents have flowed down over the transverse colon, and collected in the pelvis, giving early signs of peritonitis. The leukocyte count, at first normal, is now 12,000, 15,000 or 20,000. The differential diagnosis is more obscure, and unless the physician keeps in mind the sudden onset of terrible, epigastric pain, accompanied by early rigidity, he is very apt to make a diagnosis of acute appendicitis.

Hertz⁴ reported sixty cases, forty-three of which were admitted to the hospital wrongly diagnosed as appendicitis.

The loss of liver dullness sign should not be considered. It is unreliable, and usually absent until the case has reached the general peritonitis stage. However, some gas does usually enter the peritoneal cavity early, and if the patient is where a fluoroscope can be used, it will be found in the highest portion of the abdomen, when he is placed in various positions.

There are several conditions whose symptomatology so closely resemble perforated ulcer that they should be eliminated. Among them are acute pancreatitis, mesenteric thrombosis, acute gastric dilatation, gastric crisis of tabes dorsalis, food poisoning, appendicitis, gallstone colic, and internal hernia.

Prognosis.—All writers agree on one point, and that is, if these perforation cases are operated within six hours, 100 per cent get well. If the case is held twenty-four hours, the mortality will

be 45 per cent, and after forty-eight hours, practically 100 per cent die.

Dever⁵ says, "Better an early operation by an indifferent surgeon, than a late one by a master."

We occasionally hear of deaths from acute indigestion, but proper investigation would prove, in the majority of instances, that there was a perforation of either duodenal or gastric ulcer. The burden of the diagnosis and prognosis rests with the general practitioner, and if he be a physician who prides himself on being conservative, one who always postpones operative procedure as long as possible, the prognosis will be extremely grave. Many of his patients will have passed into the second or third day of the illness, when they are cold and blue and toxic from a general peritonitis, before the surgeon sees them. The prognosis in these cases will be about 100 per cent mortality. Fortunately, the number of physicians who procrastinate is rapidly becoming fewer each year, and the real object of this paper is to help reduce that number to a minimum.

Treatment.—The treatment of acute perforated ulcer is surgical, exclusively, and the most important consideration is early diagnosis and operation.

The long, median epigastric incision causes less bleeding, may be more rapidly and securely closed, and gives plenty of room.

Butler⁶ says, "There is a great difference of opinion as to whether or not to do a gastroenterostomy after suture of the ulcer." There are about an equal number of writers for and against it, but one gets the impression from those who report the largest number of cases that, in competent hands, gastroenterostomy is advisable, unless the patient is too sick, from shock or toxemia, to warrant the procedure.

Many reserve gastroenterostomy for cases of partial obstruction, or those which they think will have future trouble. If the surgeon is one who is not familiar with the technic of gastroenterostomy, he should simply close the ulcer, and leave any further operative procedure for the few who have later trouble.

However, a careful review of the literature leads one to conclude that gastroenterostomy is the method of choice and is growing in favor, for as Lewishon⁷ says:

- "(1) Gastroenterostomy done immediately does not increase the mortality.
- (2) It simplifies postoperative treatment.

- (3) Simple closure of perforation will not cause a cure of the ulcer in a considerable number of cases.
- (4) Gastroenterostomy will insure proper drainage of the stomach contents, and overcome partial obstruction of the pylorus, caused by postoperative adhesions.
- (5) Closure of the perforation, gastroenterostomy and pyloric exclusion, should be the method of choice in the treatment of pyloric and duodenal ulcers.
- (6) Simple closure of the perforation should be reserved for only those patients whose general condition is so poor that even a rapidly performed gastroenterostomy would be too much of an operative risk."

How shall we take care of the fluids which have escaped into the abdominal cavity? Flushing out the peritoneal cavity is not advisable. Aspiration is the simplest method, and careful sponging may be done, where food is present in large quantities. Drainage may be omitted in the six-hour cases, or a soft rubber tube may be used, reaching to the right kidney fossa. We have been in the habit of using suprapubic drainage in our cases.

CONCLUSION

Sudden, severe epigastric pain, accompanied by board-like rigidity of the upper abdomen, should make one suspect acute perforation, and surgical intervention should be advised at once. Whether or not a gastroenterostomy is done, should be determined after the abdomen is opened."

An operation done within six hours gives practically 100 per cent cures, regardless of the type of operation.

Cases not operated before forty-eight hours nearly all die.

TEN CASES—PERFORATED ULCER

Total number	10
Male sex	10
Age	26 to 68
Previous ulcer history.....	6
Typical onset	10
Hour of operation.....	8 to 36
(Average)	plus 15
Diagnosis made	4
Simple suture	5
Suture with gastroenterostomy.....	5
Deaths	1
Recoveries	9

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DISCUSSION

DR. JAMES E. ARNOLD, Vernon Center: I have listened to Dr. Holbrook's paper with a great deal of interest. As Dr. Holbrook has said, it is up to the general practitioner to make an early diagnosis and call in surgical consultation or to take the case to a hospital at once for an early operation or observation. Because, in the largest majority of cases it is the family doctor or general practitioner who is called for in an emergency of this sort. If he does not recognize the seriousness of the case and advise an immediate operation he is going to find at the end of two or three days a well-developed general peritonitis with all its seriousness and with little hope of recovery for his patient.

I think you will all agree with me that this is true in the largest majority of cases. However, there are exceptions to this rule and it is possible to have a perforation without a general peritonitis, providing it is a small one and it is immediately walled off by adhesions or the area is already covered by adherent tissue.

As nearly as I can sum up in going over the cases of perforation I have seen, the average general practitioner would see one or two cases of acute perforation in three years. I have seen a good many cases of severe appendicitis and acute renal or biliary colic, but have seen just one case of ruptured duodenal ulcer in a period of three years.

In this particular instance the family called by telephone about 1 A. M. and told me to come at once and to hurry. I had three miles to go. As soon as I got out of the car I could hear the patient. He was groaning loudly and at times yelling with pain. When I entered the room I found him lying absolutely still—not moving a muscle—but he could not keep from yelling with pains at times or making some sort of an outcry. He was not the least hysterical in type. It required a hypodermic of morphine before attempting an examination. One-fourth grain had but little effect and in half an hour another fourth grain was given him along with inhalations of chloroform and finally he quieted down enough so I could talk to him.

I thought of gall-stone colic, as I had just seen a severe case recently, but this seemed different. It was more severe. The sudden onset, the board-like rigidity, the very intense pain, as Dr. Holbrook says, are the only symptoms needed for the diagnosis. Besides this, the patient gave a typical history of repeated attacks of gastric distress for many years. Although he had never consulted a physician

for relief or treatment he had often taken soda or milk of magnesia for his gastric distress.

He rested fairly well for five hours, when the pain started again rather suddenly, requiring one-third grain morphine by hypo. I strongly advised going to the nearest hospital at once for operation or observation, but, like most people in rather poor circumstances, he did not wish to do this unless necessary. As a second recourse I urged surgical consultation, but the morphine fooled them and they decided to wait a few hours longer.

To make a long story a short one, I put him on a starvation treatment; water per rectum; no more morphine; and watched him closely for signs of general peritonitis, but much to my surprise and gratification none developed. By the end of a week he had made a fairly good recovery and I was inclined to think he had not had a perforation.

However, he did not pick up as fast as he should and later went to Rochester and was operated by Dr. Charles Mayo, who found the scar of a perforated duodenal ulcer posteriorly which had opened only slightly and had been immediately surrounded by adhesions, and so, with absolute rest, no bad results had followed. The ulcer had healed itself by perforation. Dr. Mayo did a posterior gastroenterostomy and the patient made a fairly good recovery.

Another procedure which is of diagnostic value is a leucocyte count every hour. A rapidly increasing leucocyte count indicates perforation. A steady decrease in blood pressure indicates shock and perforation also.

Finally, let me again call your attention to the value of early diagnosis and early operation.

DR. W. A. COVENTRY, Duluth: The mortality rate of the operation within six hours is very high, and I feel certain that if one starts to do a gastroenterostomy on those patients the mortality rate will be higher than it has been in the past. My own experience is that the best procedure is to go in, stitch over the ulcer and quit.

DR. FREDERICK A. OLSON, Minneapolis: On the Surgical Service at the General Hospital we see several acute perforated duodenal ulcers each year. The diagnosis is usually made in the receiving room, so that we feel that the students as they come out of school are fairly well versed in the diagnosis of this catastrophe. I have been impressed with the possibility that the study of acute perforations may be an aid in finding the cause of peptic ulcer. An understanding of the etiology of ulcer and hence its possible prevention is the one great field in gastro-intestinal medicine or surgery of today.

In acute perforations of the duodenum we see first the acute embolic ulcer which blows out like an inner tube; second, the further erosion with perforation of the chronic ulcer, often of many years' standing. We see about half and half. There is no doubt but some, particularly of the acute embolic type, will do nicely with simple suture, but you can never be sure. It is our custom to do a gastroenterostomy on all of them, agreeing with Deaver on this point even if it might be found necessary to remove the gastro-enterostomy at some future date. The house officers are often asked what they would care to have done in case they might themselves have a similar perforation. After they have observed a number of cases they unanimously

decide in favor of gastro-enterostomy because of the greatly added assurance of recovery and usually an easy immediate post-operative convalescence.

DR. C. B. WRIGHT, Minneapolis: I wish to emphasize one or two points from the standpoint of the medical man. There are many conditions in which one does not immediately call a surgeon, but in all cases of acute abdominal pain I always like to have the best and most experienced surgeon that I can get to examine the patient. Medical men do not see enough of these acute abdomens to rely upon their own judgment in these cases. The surgeons see many of them and should be called at once.

Another thing I wish to speak of is the use of morphine in acute undiagnosed abdominal conditions. I have had the experience this year of seeing two cases of acute rupture of the abdomen in patients who had had morphine and had been kept quiet for several hours, and both died. I believe if they had not had the morphine, but had been allowed to have their pain, they would have sought surgery much sooner than they did and might have been saved.

Another thing is that any medical man who is called in to see a patient with any acute abdominal condition, and that patient tells him that "Dr. So-and-So treated me six months ago," would be wise to get into communication with the doctor by telephone or some way as soon as possible. I constantly see men taking patients to the hospital and operating on them—patients whom they know other men have had under their care and have observed for long periods of time—operating upon them within the first few hours after seeing them without even asking the doctor who has been taking care of the patient what he thinks about the case.

DR. A. E. BENJAMIN, Minneapolis: I have seen a few cases in which mistakes have been made, confusing appendicitis with acute perforating ulcer, and one important case in which the operation had been performed and the appendix removed. The surgeon had failed to look a little higher up. The appendix was diseased, but he did not find the perforated ulcer. That, I think, we should all have in mind when we make an incision, if we are not positive. In acute perforating ulcer this is manifested by an increased leukocytosis and in many other ways. The surgeon should extend the incision sufficiently to examine the stomach and duodenum when in doubt.

There is one class of case that troubles us considerably and that we see few of, and that is the thick and indurated edges of the ulcer that are hard to close. We cannot put a suture that will hold in the tissue to close it over and we may not have any tissue except the omentum to use for this purpose. A recent case illustrates this point. A student at the University with acute symptoms was taken to the hospital. We found a large perforation of that type that we could not close. I used the omentum, but could not close it sufficiently to be sure it would remain closed on account of gas accumulations in the stomach, so we passed a small tube through the nostril, down into the stomach to limit the gastric tension. I think this is a good point to remember. This patient had no discomfort after the operation, because all the gas immediately came

up through the tube. It kept the stomach clean and empty. I think this procedure should be adopted in many an abdominal case as well. In the morning he vomited it out, but remained comfortable. The patient made an uneventful recovery.

DR. J. S. HOLBROOK, Mankato (closing): Of the ten cases we did a gastroenterostomy in five, with simple closure in the others. One of the cases in which we did the simple closure, I remember, had acute obstruction a few months later, and we then did a gastroenterostomy. From my own experience I would not attempt to say which is the best plan, but from those who report most of the cases it seems that it is best to do the gastroenterostomy at the time of the first operation.

I thank the gentlemen for their liberal discussion.

THE NUTROIDS FRAUD

Nutroids has been marketed as "a safe obesity cure" by one R. Lincoln Graham. It was claimed (1) that Graham was "an eminent physician, a stomach specialist who has obtained exceptional honors in his profession," (2) that he had discovered "the real cause of fat," (3) that "obesity is brought about by an overdevelopment of alcohol in the digestive tract," and (4) that Graham had discovered the method of preventing the overdevelopment of alcohol by the administration of the product he called Nutroids. The scheme was essentially a mail order fraud. More recently the nostrum was also sold through drug stores. In due course the postal authorities got round to Graham and his "Nutroids" and secured an agreement that Nutroids would not be sold through the mails. Graham can no longer swindle the public through the mails; if done at all, it must be done through the agency of such retail druggists as are willing to cater to this form of quackery. (*Jour. A. M. A., Aug. 15, 1925, p. 522.*)

SUPSALVS AND MERSALV

Supsalvs are arsphenamin suppositories put out by the Anglo French Drug Co., and Mersalv is stated by the same firm to be a 10 per cent ointment of metallic mercury. In 1920, the Council on Pharmacy and Chemistry reported unfavorably on Supsalvs, because there was no acceptable evidence of the efficiency of arsphenamin administered rectally. Since then the inefficiency of the rectal administration of arsphenamin has been demonstrated by controlled clinical trials. The identity of the ingredients that form the base of Mersalv is not declared by the manufacturer. There is no good evidence to show that Mersalv—or any other proprietary mercurial preparation—is therapeutically superior to the official ointment of mercury.

(*Jour. A. M. A., Aug. 22, 1925, p. 630.*)

TUBERCULIN IN TUBERCULOUS ADENITIS

Tuberculin seems to be indicated when the disease is strictly localized, and especially in involvement of the cervical lymph gland. Its administration is carried on in the same way as in the tuberculin treatment for other purposes with doses that produce a slight local reaction but fall short of a general one.

(*Jour. A. M. A., Aug. 15, 1925, p. 539.*)

CALCIUM IN TUBERCULOSIS

Calcium salts have been administered in the treatment of tuberculosis for various alleged reasons: to remedy calcium deficiency; to lessen inflammatory exudate; to favor calcification of lesions; and to lessen sweating and diarrhea. But calcium is not considered as an essential remedy by critical students of the subject.

(*Jour. A. M. A., Aug. 15, 1925, p. 539.*)

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION,
SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN
MINNESOTA MEDICAL ASSOCIATION, AND MINNE-
APOLIS SURGICAL SOCIETY

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its

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All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of \$1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VIII OCTOBER, 1925 No. 10

EDITORIAL

Inter-State Assembly

With the near approach of the meeting of the Inter-State Post Graduate Assembly in St. Paul this month, we feel that we would be remiss in not again calling the attention of the profession to the importance of this meeting. Next to the annual meeting of the American Medical Association this is the largest medical meeting we know of. Decidedly general in the nature of subjects handled and consisting for the most part of clinics by university professors, the attending physician will be offered a great variety of authoritative information for five solid days. There are no sections to this association. Surgical clinics are followed by medical ones and these in turn by clinics in the specialties. The personnel of the program assures the success of the meeting. The physicians of Minnesota and the Northwest have a feast set at their feet. They should make the most of their opportunity by taking a week off to add to their store of medi-

cal knowledge and receive the inspiration which they are bound to derive from this meeting.

Aside from the eminent clinicians whose names appear on the program of the meeting, certain distinguished foreign guests will take part. These include the Rt. Hon. Lord Dawson of Penn and Sir William Arbuthnot Lane, both of London; Mr. William Blair Bell of Liverpool; Professor Vittorio Putti of Bologna, Italy; Mr. Philip Franklin of London; Dr. H. L. McKisack of Belfast, Ireland; and Dr. W. H. Parkes of Auckland, New Zealand.

Vital Statistics in Minnesota

We realize fully the care that must be exercised in drawing conclusions from vital statistics covering short periods of time. Certain general tendencies can, however, be seen in the tables recently prepared by our State Board of Health covering the past fifteen years.

The most striking reduction in mortality during this period has been in diarrheal diseases of children. This improvement has been marked and progressive almost without a waver from the high point of 1,799 deaths from this cause in 1910 to the low figure of 298 in 1924. General knowledge of the importance of cleanliness in the handling of milk and milk containers and the general habit of boiling milk for infants doubtless account in large measure for this gratifying change. It will be interesting to see whether the statistics for 1925 confirm the impression that there has been more summer diarrhea this summer than usual.

There has been in Minnesota an even greater reduction in the mortality percentage in typhoid fever. During the first five years of the fifteen-year period tabulated there had been over 2,000 deaths yearly from typhoid, whereas during the last eight years this number has been consistently under one hundred. The low figure was reached in 1924, when only thirty-seven deaths occurred.

Mortality due to contagious diseases always varies markedly depending on epidemics. Diphtheria, in spite of the remarkable results obtained with antitoxin, exerts a higher toll than scarlet fever. The general impression, however, is that scarlet fever today is not such a virulent infection as it was a generation ago. The general use in Minnesota of diphtheria toxin-antitoxin and the newly elaborated scarlet fever antitoxin (possibly preventive inoculation also) should materially

lower the mortality in both these diseases. Measles and whooping cough, although fluctuating widely in their death toll, have each at times during the past fifteen years been the cause of more deaths than either scarlet fever or diphtheria.

As pointed out in one of our previous editorials, the influenza epidemic covered a period of several years, the mortality rate having been definitely above the normal for three years previous to the fateful year of 1918, when 7,521 died of the disease in Minnesota. In both 1919 and 1920 over 2,000 died each year from this cause and even in 1922 and 1923 a sort of back-lash occurred with 402 and 609 deaths, respectively, figures much above the average.

The course of tuberculosis is of interest. Minnesota was a pioneer in anti-tuberculosis activities. The state law providing for county sanatoria went into effect in 1913. With what effect on the mortality rate? During the years from 1910 to 1918 there was no demonstrable improvement in the tuberculosis death rate. In the year 1918 the rate took a jump, doubtless the result of the influenza epidemic. Since 1918, however, the death rate from pulmonary tuberculosis has shown a definite fall from 90.7 in 1918 to the lowest rate on record in Minnesota of 56.05 in 1924. There has been a corresponding decrease in the number of deaths from other forms of tuberculosis since 1918. Whatever the case may be in Europe, tuberculosis has been on the decrease in Minnesota since the termination of the World War.

During the last fifteen years Minnesota has shared in the marked general increase in cancer. Since 1910 the low figure of 1,391 has rapidly and almost without a waver mounted to the high figure of 2,558 in 1924. Neither increase in population nor better diagnosis can account wholly for this startling change. Cancer is on the increase.

It is rather surprising to find no definite increase in accidental deaths in Minnesota during this period. We are led to believe by the newspapers that we are all headed for an automobile death and with the enormous increase in the number of autos and the steady growth in population we would expect a rise in this figure.

We also hear a lot about the number of homicides since the war, as though the civilian army had all gotten the habit of shooting their fellow-men during the war and were continuing it. It is rather gratifying to find there has been no definite

increase in the homicides in Minnesota since the war.

No relation can be seen between incidence of suicide in Minnesota and either business conditions or fluctuations in high cost of living.

Last year heart disease headed the list as cause of deaths in Minnesota as elsewhere. The rates per 100,000 population for the six leading causes of death were: Heart disease, 135.7; cancer, 101; pneumonia, 70.6; accidents, 60.5; nephritis, 58.3; pulmonary tuberculosis, 56.1. Surely, here is an array worthy the best efforts of preventive medicine.

OBITUARY

DR. HUGO HARTIG*

Hugo Hartig was born in Minneapolis, Minn., November 14, 1890, the son of Rev. Henry and Emma Bronner Hartig, and died July 26, 1925, in an automobile accident at Lake Minnetonka.

He was a graduate of the North High School, Minneapolis, and of the University of Minnesota Medical School, 1914, and served his internship at the Elliot Memorial Hospital.

In 1918 he took post-graduate work at the Bellevue Hospital, New York, and in the Cornell Medical School. In the same year he entered the military service and was stationed at Camp Sherman in the United States, and with Base Hospital No. 99 in France until May, 1919.

He became a member of the Minneapolis Board of Public Welfare in 1922 and was appointed County Physician of Hennepin County in 1923. He held a teaching position in the University of Minnesota Medical School in 1917 and 1918 and served on the staff of St. Andrew's Hospital until the time of his death. He was a member of the Veterans of Foreign Wars and was State Commander of that organization.

His wife, Hermina Hermanson-Hartig, M.D., and four children survive him.

In all his relations with the various organizations in which he took an active part he displayed an unfailing industry, a never-flagging energy, and an ever-inspiring enthusiasm. It is rare to find a record of one man who has filled so large a place in a city as he has in his. His few years of professional life stand high on the rising curve of medical progress in his community.

J. C. MICHAEL,

J. H. SIMONS,

OLGA S. HANSEN,

Chairman, Necrologic Committee, Hennepin County Medical Society.

*Read before the Hennepin County Medical Society, Sept. 14, 1925.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

INTER-STATE POST GRADUATE ASSEMBLY

The annual session of the Inter-State Post Graduate Assembly will be held this year in St. Paul, October 12-16, inclusive. Headquarters will be at the Saint Paul Hotel with the scientific program and exhibits at the municipal auditorium.

The scientific program will occupy morning, afternoon and evening each day. The complete program appeared in the September issue of MINNESOTA MEDICINE.

Wednesday evening, following a brief evening session, a reception will be tendered the President, Dr. Addison C. Page of Des Moines. This will be followed by an informal entertainment for visiting physicians and their ladies tendered by the Ramsey County Medical Society.

The banquet, which is an annual Friday evening affair, will be held at the Masonic Temple. The banquet hall will accommodate 1,000 and a large attendance is indicated. Tickets will be sold in advance so as to avoid inconvenience of service frequently experienced at such affairs. It is the wish of the officers of the Assembly that the banquet be largely attended by lay men and women as well as physicians and their wives. Many besides the medical profession are interested in modern medicine and will welcome, it is believed, the opportunity to hear the banquet addresses, which will not be confined to medical subjects. The following distinguished speakers will make addresses:

Honorable Theodore Christianson, Governor of Minnesota.

Honorable Arthur E. Nelson, Mayor of St. Paul.

Dr. George W. Crile, Cleveland, Ohio.

Rt. Hon. Lord Dawson of Penn, G.C.V.O., C.B., London, England.

Sir William Arbuthnot Lane, Bt., London, England.

Mr. Charles H. Markham, President of the Illinois Central Railroad.

Dr. Charles H. Mayo, Rochester, Minnesota.

Dr. William J. Mayo, Rochester, Minnesota.

Sir Henry Thornton, President of the Canadian National Railroad.

The importance of obtaining banquet tickets early, preferably before the week of the meeting, is emphasized. Tickets may be obtained from the chairman of the banquet committee, Dr. C. N. Hensel, 1014 Lowry Bldg., St. Paul, Minnesota, on remittance of \$5.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

At the annual meeting of the Northern Minnesota Medical Association, held in Brainerd, August 24 and 25, 1925, the following officers were elected for the coming year: President, Dr. O. J. Hagen, Moorhead; vice president, Dr. O. V. Johnson, Sebeka; secretary-treasurer, Dr. F. J. Hirschboeck, Duluth; censor, Dr. W. W. Will, Bertha.

The 1926 meeting will be held in Crookston, the exact date to be decided later.

CENTRAL MINNESOTA DISTRICT MEDICAL ASSOCIATION

The vacation meeting of the Central Minnesota District Medical Association was held Wednesday, August 26, 1925, at the country club at Green Lake.

The following program was given:

"Physiotherapy, general physiological considerations"...

J. R. Sturre, M.D., Watkins

"Mercurochrome in acute infection of the central nervous system"

W. H. Hengstler, M.D., St. Paul

"Exophthalmic goiter—Its diagnosis and treatment"....

James A. Johnson, M.D., Minneapolis

"The present status of prevention and treatment of scarlatina"

C. L. Scofield, M.D., Benson

AMERICAN BOARD OF OTOLARYNGOLOGY

The next examination given by the American Board of Otolaryngology will be held at the Cook County Hospital, Chicago, on October 19, 1925. Application should be made to the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

NICOLLET-LESUEUR COUNTY MEDICAL SOCIETY

The fall meeting of the Nicollet-LeSueur County Medical Society was held at St. Peter State Hospital on Thursday, September 3, 1925. Dinner was served at 6:30 p. m. The scientific program was given over to a lecture, with moving pictures and slides, on "Late Technic in Psychotherapy Methods."

A resolution was passed, thanking Representative Oscar Swenson for interest shown in securing favorable and deserving medical legislation and expressing the approval of his excellent work in the last session of our State Legislature. The secretary was instructed to sign the names of each member of the Nicollet-LeSueur County Medical Society to this resolution.

A second resolution, expressing regret because of the retirement of Dr. R. M. Phelps as Superintendent of the State Hospital, St. Peter, Minn., and of the transfer of Dr. Geo. T. Baskett, the Assistant Superintendent, to be Superintendent at Willmar, Minn., was unanimously passed. They were commended for their faithful and efficient work and helpfulness in society activities.

JOHN D. RICKER, "MAGNETIC MASSEUR"

An advertisement in an Ann Arbor newspaper notified "chronic sufferers" that John D. Ricker, "Noted Magnetic Masseur," would be at a local hotel and advised the blind, the deaf and the halt to come and be cured. The health officer of Ann Arbor believes in protecting the fool from his folly and the sick from the quack and, as a result, he, with other local officials, were on hand to await the arrival of the magnetic masseur. Ricker did not come, but two of his representatives were arrested, found guilty of practicing medicine without license and ordered to get over the state line in the shortest possible time.

(*Jour. A. M. A., Aug. 22, 1925, p. 628.*)

OF GENERAL INTEREST

Dr. F. R. Walters, formerly of Moose Lake, is now located at Battle Creek, Michigan.

Dr. James K. Anderson, formerly of Deerwood, has become associated with the Sunnystre Sanatorium at Crookston.

Dr. W. C. Stillwell has severed his connections with the Mankato Clinic and has become associated with Dr. F. H. Paterson at Santa Ana, California.

Dr. Lloyd H. Ziegler, formerly of the Mayo Clinic, Rochester, has become associated with the Colorado Psychopathic Hospital, Denver, Colorado.

Dr. S. N. Mogilner has returned from Vienna, where he has spent some time in post-graduate study, and has established offices at 626 Lowry Bldg., St. Paul, for the practice of his specialty, obstetrics and gynecology.

Dr. H. E. Michelson of Minneapolis has been appointed by the Board of Regents to be the Director of the Department of Dermatology and Syphilology at the University of Minnesota, and will take up his duties at the beginning of the fall quarter.

Dr. Russell D. Carman of the Mayo Clinic, Rochester, has just returned from a trip to Europe, where he visited the X-ray Clinics of Germany, Austria, France, England and the Scandinavian countries. Dr. Carman was accompanied by Mrs. Carman and Dr. and Mrs. Robert J. May of Cleveland, Ohio.

Dr. Russell D. Carman attended the meetings of the Idaho and Utah state medical societies, before which he read papers, the early part of September. The Idaho Association held its meeting at Pocatello, September 3 to 5. The Utah Association meeting was held at Salt Lake City, September 7 to 12.

Dr. Hugo O. Altnow, formerly of Mandan, N. D., and for the past one and one-half years voluntary graduate Assistant and Junior Associate in Medicine in the Medical Clinic of Dr. Henry A. Christian of Boston, has associated himself with the Nicollet Clinic of Minneapolis, Division of Internal Medicine.

An Orthopedic Clinic was held at St. Peter, Minn., September 5, by Dr. Paul Jepson of Rochester, Minn., which was well attended. B. F. Cosgrove, assistant director of the state department of re-education, was present and registered a number of applicants for this work. The Clinic was held under the auspices of the Nicollet-LeSueur County Medical Society.

At the last meeting of the medical course, given at Fergus Falls by the Extension Division of the University of Minnesota on Sept. 7, it was decided by the Park Region Medical Society that a request be made to the University for a similar course next year. The physicians who attended these lectures feel deeply indebted to the men sent out by the University, who so liberally gave of their time for this work and for the splendid way in which their subjects were presented.

The annual Roll Call of the American Red Cross, to enroll members for 1926, will be held this year as usual from Armistice Day to Thanksgiving, November 11 to 26. The American Red Cross, with a membership of three and one-half millions and an additional Junior membership of six millions, has become the recognized agency of the American people for extending special service to suffering humanity. This work is supported through the membership dues secured once a year at Roll Call time. The co-operation of all medical men has been urgently requested.

Twenty-three physicians from the three counties, Goodhue, Rice and Dakota, which maintain Mineral Springs Sanatorium at Cannon Falls, were the guests of the sanatorium at a chicken dinner on August 28. Following the dinner two papers were read, "Early Diagnosis of Tuberculosis," by Dr. W. D. Beadie, superintendent of the sanatorium, and "Tuberculosis in Goodhue County," by Dr. M. W. Smith of Red Wing. According to the figures given the average tuberculosis mortality rate per 100,000 population for Goodhue County, which from 1900 to 1914 was 133, while the state rate was 106 for the same period, became 68 for the five years 1920 to 1924, with a state rate of 77.9. In 1924 the rate was 50 for the county and 67.8 for the state.

Plans were made for the training schools of the three counties to give their student nurses short courses in tuberculosis at the sanatorium as a regular part of the curriculum.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council in Pharmacy and Chemistry:

E. BILHUBER, INC.:

Theocalcin, 7.5 gr. Tablets

LEDERLE ANTITOXIN LABORATORIES:

Anti-Anthrax Serum 20 c.c. Vial

Tuberculin Pirquet Test ("T.O.") 10 Capillary Tubes

Tuberculin Pirquet Test ("T.O.") 25 Capillary Tubes

MERCK & CO.:

Iodipin 40 Per Cent

Ampules Iodipin 40 Per Cent, 1 c.c.

Ampules Iodipin 40 Per Cent, 2 c.c.

II. A. METZ LABORATORIES:

Novarsenobenzol-Billon, 0.15 gm. Ampules

Novarsenobenzol-Billon, 0.3 gm. Ampules

Novarsenobenzol-Billon, 0.45 gm. Ampules

Novarsenobenzol-Billon, 0.75 gm. Ampules

H. K. MULFORD Co.

Proteins Dried-Mulford—Almond, Apple, Asparagus, Banana, Barley, Bean, Beef, Beet, Buckwheat, Cabbage, Cantaloupe, Carrot, Cat Hair, Cattle Dander, Cauliflower, Celery, Chicken, Chicken Feather, Clam, Cocoa, Codfish, Coffee, Coli (Communis) Bacillus, Corn, Cucumber, Diphtheroid (Polyvalent) Bacillus, Dog Hair, Dysentery Bacillus (Polyvalent), Egg-

plant, Egg White, Egg Yolk, Flaxseed, Friedlander Bacillus, Goose Feather, Gonococcus Bacillus (Polyvalent), Guinea-Pig Hair, Horse Dander, Horse Serum, Influenza Bacillus, Kapok, Lamb Protein, Lettuce, Lobster, Mackerel, Meningococcus Bacillus (Polyvalent), Micrococcus Catarrhalis Bacillus, Milk, Mushroom, Onion, Orange, Orris Root, Oyster, Paratyphosus Bacillus "A" or "B," Pertussis Bacillus (Polyvalent), Pea, Peanut, Pepper (Black), Pneumococcus Bacillus (Polyvalent), Pork, Potato, Rabbit Hair, Rice, Rice Powder (Polish), Rye, Salmon, Spinach, Squash, Strawberry, Sheep's Wool, Staphylococcus Bacillus (Albus and Aureus), Streptococcus Bacillus (Polyvalent), Sweet Potato, Tea, Tomato, Tobacco, Tubercle Bacillus (Human), Tubercle Bacillus (Bovine), Typhosus Bacillus, Veal, Walnut, Wheat.

PARKE, DAVIS & CO.:

Mercurosol Solution
Neo-Silvol Ointment 5 Per Cent
Neo-Silvol Vaginal Suppositories
Scarlet Fever Streptococcus Antitoxin Concentrated (Globulin)-P. D. & Co.

SHARP & DOHME, INC.:

Caprokol (Hexylresorcinol-S. & D.), 2.5 Per Cent Solution in Olive Oil

E. R. SQUIBB & SONS:

Insulin-Squibb, 10 Units, 10 c.c.
Insulin-Squibb, 20 Units, 10 c.c.
Insulin-Squibb, 40 Units, 10 c.c.
Insulin-Squibb, 80 Units, 10 c.c.
Smallpox (Variola) Vaccine (Glycerinated), 1 Tube
Tetanus Antitoxin Purified, 20,000 Units

STANDARD CHEMICAL CO.:

Radon-Standard Chemical Co.

WINTHROP CHEMICAL CO.:

Sajodin Tablets, 1 gr.

Pituitary Extract Obstetrical-Merrell.—A slightly acid aqueous solution containing the water-soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle, preserved with 0.5 per cent of chlorbutanol. It is standardized so that 1 c.c. has an activity on the isolated uterus of the virgin guinea pig corresponding to not less than 80 per cent nor more than 120 per cent of that produced by 0.005 gm. of standard, defatted, dried powdered posterior lobe of the pituitary gland of cattle. For a discussion of the actions and use of pituitary solution, see Pituitary Gland (New and Non-official Remedies, 1925, p. 260). Pituitary extract obstetrical-Merrell is marketed in ampules containing 0.5 c.c. and 1 c.c. The Wm. S. Merrell Co., Cincinnati.

Pituitary Extract Surgical-Merrell.—A slightly acid, aqueous solution containing the water-soluble principle or principles of the fresh posterior lobe of the pituitary body of cattle, preserved with 0.5 per cent of chlorbutanol. It is standardized so that 1 c.c. has an activity on the isolated uterus of the virgin guinea pig corresponding to not less than 80 per cent nor more than 120 per cent of that produced by 0.01 gm. of standard, defatted, dried, pow-

dered posterior lobe of the pituitary gland of cattle. For a discussion of the actions and uses of pituitary solution, see Pituitary Gland (New and Non-official Remedies, 1925, p. 260). Pituitary solution surgical-Merrell is marketed in ampules containing 1 c.c. The Wm. S. Merrell Co., Cincinnati.

Solarson.—A 1 per cent solution of ammonium heptachlorarsenate rendered isotonic by the addition of sodium chloride. Solarson contains from 2.255 to 0.275 gm. of arsenic (As) in 100 c.c. Experimental evidence indicates that the arsenic of solarson is readily liberated in the system and is well utilized. It is claimed that solarson has an advantage over the cacodylates because its arsenic is better utilized, and over the arsenilates in that subcutaneous and intramuscular injection produce less pain and are less liable to produce toxic effects. Solarson is used as a means of obtaining arsenic effects in the treatment of anemia, chlorosis, malaria, neuroses and dermatoses. Solarson is supplied in ampules containing 1.2 c.c. Winthrop Chemical Co., Inc., New York.

Bismosol.—A solution of potassium sodium bismuthotartarate (containing 35 per cent bismuth), 10 gm.; piperazine, 0.3 gm., in an aqueous solution of glucose sufficient to make 100 c.c. Bismosol is proposed as a means of obtaining the systemic effects of bismuth in the treatment of syphilis (Bismuth Compounds, New and Non-official Remedies, 1925, p. 73). Bismosol is administered intramuscularly. It is supplied in ampules containing 1 c.c. Powers-Weightman-Rosengarten Co. Philadelphia.

Caprokol (Hexylresorcinol-S. & D.), 2½ Per Cent Solution in Olive Oil.—A solution of caprokol 2.5 parts in olive oil to make 100 parts. For a discussion of the actions, uses and dosage of caprokol, see Jour. A. M. A., May 2, 1925, p. 1338. Sharp & Dohme, Baltimore.

Sajodin Tablets, 1 Grain.—Each tablet contains sajodin, 1 grain. For a discussion of the actions, uses and dosage of sajodin, see New and Non-official Remedies, 1925, p. 182. Winthrop Chemical Co., New York.

Scarlet Fever Streptococcus Antitoxin Concentrated (Globulin)-P. D. & Co.—A scarlet fever streptococcus antitoxin (Jour. A. M. A., May 2, 1925, p. 1338) prepared from the serum of horses treated with subcutaneous injection of toxic filtrates from cultures of scarlet fever streptococci and also with intravenous injections of the streptococci themselves. Each c.c. neutralizes from 35,000 to 40,000 skin test doses of sarlet fever toxin. The product is marketed in packages of one syringe containing 2.5 c.c. and in packages of one syringe containing 10 c.c. Parke, Davis & Co., Detroit. (Jour. A. M. A., Aug. 8, 1925, p. 437.)

Diphtheria Toxin-Antitoxin Mixture 0.1 L+.—A diphtheria toxin-antitoxin mixture (New and Non-official Remedies, 1925, p. 333), each c.c. containing 0.1 lethal dose of diphtheria toxin neutralized with the required amount of diphtheria antitoxin. Marketed in packages of three 1 c.c. vials; in packages of one 30 c.c. vial; in packages of ten vials, each containing three doses. Eli Lilly & Co., Indianapolis.

Typhoid Mixed Vaccine, Prophylactic and Therapeutic.—(New and Non-official Remedies 1925, p. 360.) This is also marketed in packages of three 1 c.c. vials. Eli Lilly & Co., Indianapolis.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

MASSIVE DOSES OF STRYCHNIA IN MYASTHENIA GRAVIS: REPORT OF TWO CASES

C. EUGENE RIGGS, M.D.
St. Paul

Seventeen years ago, I reported three cases of myasthenia gravis. One of these patients died; one is living and the remaining case passed from observation. In all of these I tried strychnia, but not in massive doses. Within the past six months, Dr. Hengstler and I have used strychnization in two patients—a therapy first suggested by Dr. W. O. Bridges of Omaha, but in 1922 popularized by Dr. Charles Dana.

CASE 1. Miss E., aged 22. Present illness began two and one-half years ago with pain in the back of the neck. The "nasal" or "canine smile," which is usually the first symptom, was well marked. She next observed that when playing the piano the third finger of the right hand became powerless. After resting, power returned. She also noticed that after singing a little while she would lose her voice suddenly; rest restored it. There then developed difficulty of swallowing, especially towards night; frequently liquids would run out of the nostrils. For the past year there has been trouble with vision: blurring; then diplopia. Examination showed no unbalance of the external eye muscles; diplopia occurred on forced convergence or effort at prolonged accommodation. Convergence was poorly controlled. There was at times ptosis due to general weakness. The fundi were normal (Burch). The occipito-frontalis was paretic; she could not wrinkle her forehead. The corrugator supercillii were unaffected. While eating, the lower jaw would drop down and she would have to support it with the hand; talking also caused this symptom. The arms and legs tired very quickly from exercise. On one occasion the legs gave way suddenly and she fell downstairs. While under treatment there occurred great exaggeration of her symptoms; diplopia became very marked. There was ptosis of the right upper eyelid. She was unable to raise her head from the pillow and both arms were practically paralyzed. She suddenly developed a choking spell and was apparently pulseless. She complained of cramping of muscles of the back and could only breathe by laying her head over the side of the bed. During her stay at the hospital, she experienced difficulty in urination. Her outstanding symptoms were trouble in talking and swallowing. The myasthenic reaction was present in both arms and legs. The x-ray showed the thymus to be normal.

CASE 2. Miss A., aged 20, had infantile paralysis in 1920. There was some permanent atrophy of right arm and leg and a slight limp in her walk. The left hand was smaller than the right. The only other symptom left from the poliomyelitis was a double Babinski not infrequently

observed as a left-over after this infection. The "nasal" smile was very definite. She could not pucker her lips and complained of their being stiff, making mastication difficult. She could not swallow several times in succession. There was ptosis of both upper eyelids. The head would drop to the chest. The occipito-frontalis muscle was paretic and she very imperfectly wrinkled her forehead. The face was expressionless. These symptoms were of a year's duration; walking was difficult from the first, the slightest exertion making it impossible; a short rest and it could be resumed, but finally she was compelled to crawl. The arms were similarly affected. She could write only for a short time; was unable to button her clothes, hold a pin or a spoon. Of late, when eating, the lower jaw would drop and she would have to support it with her hand. Sensation was normal. The thymus gland was normal. The myasthenic reaction was obtained in both upper and lower extremities.

In Miss E.'s case, the physiological limit was one-fifth grain of strychnia twice a day. Then she developed a hypersensitiveness to the drug and was not able to go beyond a one-sixteenth of a grain. When she left the hospital, she was very greatly improved, was able to walk a little and played some on the piano. Some months later she unfortunately took a severe cold, which caused a recurrence of the old symptoms, but in a very much milder degree.

The interesting fact in Miss A.'s case was that even though she was taking a fifth of a grain of strychnia twice a day, she manifested no physiological effects. She developed a slight temperature; had a vomiting spell and grave cardiac disturbance occurred. This is easily understood, since the involuntary muscular system is also affected in this disease. The symptoms of a left lobar pneumonia manifested themselves and a few hours later she died. The ptosis and swallowing greatly improved under treatment.

In one case, Dana gave one-fifth grain strychnia twice a day; he was four weeks in reaching this dose. To another patient he gave one-seventh grain twice a day. After ninety-two injections were given, the dose was reduced to one-twelfth grain twice a day. A third patient was given one-fourth grain strychnia twice a day. In one of Dana's three cases, in which massive doses were given, a slight trouble of the eye remained; otherwise, complete recovery occurred. Drs. Jackson and Bates gave one of their patients one-fourth grain strychnia hypodermically four times a day. This case left the hospital in three weeks, and three months later was reported improving.

CARCINOMA OF THE OVARY IN A THREE-YEAR-OLD CHILD: REPORT OF CASE*

E. J. HUENEKENS, M.D.
Department of Pediatrics
University of Minnesota
Minneapolis

Y. Y., a girl, aged 3, was admitted to the General Hospital, September 22, 1924. The present illness began in April, 1924, when the child was sick in bed two weeks

*From the Pediatric Department of the Minneapolis General Hospital.

with influenza. Since that time she had complained of generalized pains in the joints, with no objective symptoms and lasting for from two to four days. There was no diarrhea, vomiting, or constipation. The stools were normal. Two weeks before admission a lump about 10 cm. in diameter and about 3 cm. high was noticed on the top of the head. The first four or five days this was hard, but then became quite soft. There was no history of hemorrhage or jaundice. The past history and family history were negative.

Physical examination: The child was well developed and fairly well nourished, with marked pallor of the skin and mucous membranes. The tonsils were moderately enlarged, but not inflamed. There was a fluctuating mass about 10 cm. in diameter over the vertex. The parietal sutures were separated. There was a suggestion of icterus in the sclera. The cervical glands were enlarged, discrete, and movable. The inguinal, epitrochlear and left axillary nodes were palpable, and there was a fairly distinct enlargement of the posterior occipitals. The chest examination was negative. Examination of the heart revealed a distinct systolic thrill, most marked over the mitral area, and a diastolic murmur over the entire precordium, best heard at the base and transmitted to the back and axilla. There was no clubbing of the fingers, or cyanosis. The abdomen was protruding; the liver edge was palpable about a palm's width below the right costal margin. The spleen was also enlarged. The extremities and bony structures were apparently negative.

Aspiration of the tumor showed only blood. A spinal puncture was done, and with the exception of marked pressure the findings were negative. A study of the blood showed a marked secondary anemia; the hemoglobin was 19 per cent, erythrocytes 1,300,000, and leucocytes 14,000, with a normal differential count. Fragility tests were within the normal limits; platelet count was normal, and Wassermann was negative.

The eye-grounds were studied from time to time and showed an increase in intracranial pressure.

The first four or five days the patient was in the hospital the main trend of diagnosis was toward a blood disease, mainly the leukemias, because of the relative leucocytosis. An x-ray of the chest, however, showed some changes in the structure of the ribs, so all the long bones were rayed and showed a peculiar thinning of the cortex. A gland removed at this time showed epithelial tumor metastases with the origin undetermined, but thought most likely to be from the kidney.

The patient died twenty-four days after admittance to the hospital and autopsy showed the following: Carcinoma of the ovaries, with metastases to the liver, lymph nodes, long bones, ribs, and skull. There was also a cloudy swelling of the heart muscle.

HIND'S HONEY AND ALMOND CREAM

According to an analysis reported in 1914, Hind's Honey and Almond Cream is essentially an emulsion containing alcohol, 7.28 per cent; glycerin, 5.79 per cent; partly saponified beeswax, 5.98 per cent; crystallized borax, 1.49 per cent; perfumed with oil of bitter almonds.

(*Jour. A. M. A., Aug. 15, 1925, p. 539.*)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of September 9, 1925

The Minnesota Academy of Medicine held its Annual Meeting at the Town and Country Club on Wednesday evening, Sept. 9, at 8 o'clock. The meeting was called to order by the President, Dr. H. P. Ritchie. There were 25 members present.

The minutes of the May meeting were read and approved.

The annual reports of the Secretary-Treasurer were read and approved.

The annual election was held and the following officers were elected:

President.....Henry L. Ulrich, M.D., Minneapolis
Vice President.....Frank Burch, M.D., St. Paul
Sec.-Treas.....John Eldon Hynes, M.D., Minneapolis

A motion was carried that the rules of the Academy be suspended and a unanimous vote given for the re-election of Dr. Hynes as Secretary-Treasurer.

The Secretary read a letter from Dr. E. S. Judd inviting the Academy to hold one of its regular meetings at Rochester this year. Upon motion it was voted to hold the November meeting at Rochester.

The retiring President, Dr. Ritchie, then read his President's Address, entitled "Four Men of the Academy." These being four former presidents of the Academy—Drs. Archibald MacLaren, Warren A. Dennis, James E. Moore and Parks Ritchie.

The meeting adjourned.

JOHN E. HYNES, M.D.,
Secretary.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

THE NORMAL DIET. W. D. Sansum, M.S., M.D., Director of the Potter Metabolic Clinic, Dept. of Metabolism, Santa Barbara Cottage Hospital, Santa Barbara, Calif. Illus. 72 pages. Cloth, \$1.50. St. Louis: C. V. Mosby Co., 1925.

PERSONAL AND COMMUNITY HEALTH. Clair Elsmere Turner, Associate Professor of Biology and Public Health, Massachusetts Institute of Technology, etc. Illus. 426 pages. Cloth, \$2.50. St. Louis: C. V. Mosby Co., 1925.

EMPHYSEMA THORACIS. Evarts A. Graham, A.B., M.D., St. Louis. (Essay awarded the Samuel D. Gross Prize of the Philadelphia Academy of Surgery in 1920.) Illus. 110 pages. St. Louis: C. V. Mosby Co., 1925.

OLD AND NEW VIEWPOINTS IN PSYCHOLOGY. Knight Dunlap, Professor of Experimental Psychology, Johns Hopkins University, Baltimore, etc. 166 pages. Cloth, \$1.50. St. Louis: C. V. Mosby Co., 1925.

METHODS IN SURGERY. Glover H. Copher, M.D., Instructor in Surgery, Washington University, School of Medicine, etc. 232 pages. Cloth, \$3.00. St. Louis: C. V. Mosby Co., 1925.

SYMPTOMS OF VISCERAL DISEASE. Francis Marion Pottenger, A.M., M.D., LL.D., F.A.C.P., Monrovia, Calif. 3rd edition. 86 text illus. 10 color plates. 394 pages. Cloth, \$6.50. St. Louis: C. V. Mosby Co., 1925.

ALLERGY, ASTHMA, HAY FEVER, URTICARIA AND ALLIED MANIFESTATIONS OF REACTION. Wm. W. Duke, Ph.B., M.D., Kansas City, Mo. 339 pages. 75 illus. Cloth, \$5.50. St. Louis: C. V. Mosby Co., 1925.

OCULAR THERAPEUTICS. Dr. Ernst Franke, A.O., Professor of Ophthalmology and Chief of the Second Eye Clinic of Hamburg. Translated by Clarence Loeb, A.M., M.D., Oculist to Michael Reese Hospital, Chicago. 183 pages. Cloth, \$3.50. St. Louis: C. V. Mosby Co., 1925.

EYE, EAR, NOSE AND THROAT NURSING MANUAL. Roy H. Parkinson, M.D., Visiting Oculist and Aurist to St. Joseph's Hospital, San Francisco, Calif. 207 pages. Illus. Cloth, \$2.25. St. Louis: C. V. Mosby Co., 1925.

CLINICAL LABORATORY METHODS. Russell L. Haden, M.D., St. Louis: C. V. Mosby Company, 1924.

This book fills a long-felt need in supplying to the library on laboratory subjects a manual describing in the briefest possible terms, the procedures which may be needed in any diagnostic laboratory. Only one method is given for each test, which contributes a great deal to brevity and conciseness. In each case the latest and most approved test is given, with the reference to the original article. No discussion of interpretation of results is presented, but, instead, merely normal findings in each case.

It is especially valuable in its treatment of the newer chemical methods of the examination of blood and urine. These are given in a very comprehensive manner and are

very easily accessible in the book. Many of the newer tests, such as the volume index, liver function, Van den Bergh tests for bile pigment in blood serum, and colorimetric determination of hydrogenion concentration in biological fluids, are given. Detailed directions are also given for making the various solutions needed in the tests and the directions are unusually concise and easy to follow. For the Wassermann technique the Kolmer is gone into with such detail that it can easily be followed by laboratory workers.

Histological methods and bacteriology, however, receive scant attention in two short chapters and this division of material is indicative of the growing importance of chemical procedures in diagnosis by laboratory methods. In general, this book is a valuable contribution to the general subject of laboratory procedures and should find great appreciation from laboratory workers throughout the country. It will, however, prove to be of less interest to the clinician since there is very little discussion of application of procedures or interpretation of results.

MARGARET WARWICK, M.D.

DIABETES AND ITS TREATMENT BY INSULIN AND DIET. Orlande H. Petty, M.D., and Wm. H. Stoner, M.D. F. A. Davis & Co.

This brief, readable textbook on diabetes is designed to cover the treatment by diet and insulin in such a manner that the average patient can easily grasp the methods of estimating diets and the technique of administering insulin at home. It is in no way intended as a substitute for the physician, but merely as a help to the patient. The book is well written and gives many valuable outlines in detail of the various diets.

JAS. N. DUNN, M.D.

FOR SALE—Late Type 120 Kilovolt Acme International X-Ray Generator complete with Filament Control for 220 Volt Alternating Current. Also Acme International Combined Radiographic Fluoroscopic Table for both horizontal and vertical fluoroscopy. Two Coolidge Tubes. Complete Dark Room Equipment. Also have some office equipment to sell. Splendid buy for someone who is just installing an x-ray department. Address C-53, care MINNESOTA MEDICINE.

FOR SALE—Microtome, practically new. M. Schanze, Leipzig, pattern. Address C-43, care MINNESOTA MEDICINE.

PART-TIME WORK WANTED IN TWIN CITIES BY A PHYSICIAN

A physician with thorough training, particularly in Internal Medicine, who is a graduate of the London Hospital and is going to work at the University Clinics, desires part-time work in the Twin Cities, especially internal medical work, laboratory work, or general practice. Best of references. Address C-52, care MINNESOTA MEDICINE.

WANTED—Office in St. Paul. Eye, Ear, Nose and Throat man desires affiliation with established surgeon, general practitioner or group. Would sublet office space. Am experienced and in good standing. Address C-44, care of MINNESOTA MEDICINE.

GOOD LOCATION in North Minneapolis for young physician with some experience. Scandinavian preferred. Address C-51, care MINNESOTA MEDICINE.

WANTED—A doctor at Newmarket, Minnesota, at once. No physician within radius of twelve miles. Good location. Inquire L. B. 107, Newmarket, Minnesota.

WANTED—Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association
Northern Minnesota Medical Association and Minneapolis Surgical Society*

Vol. VIII

NOVEMBER, 1925

No. 11

THE LOWERING OF MORTALITY IN TREATMENT OF TOXIC ADENOMA OF THE THYROID*

T. L. CHAPMAN, M.D.
Duluth, Minn.

There has emanated lately, from several fields where goiter is much studied, the opinion that some degree of toxicity and very certain degeneration of essential organs may arise from other than the two groups of goiter considered previously as the exclusive causes of toxicity. Graves' disease and toxic adenoma of the thyroid have clinically demonstrated their constant power to produce these changes, and adduced laboratory evidence of activity makes their origins certain. It is a question yet undecided whether other types can produce these effects, and proponents of the newer theories have still to prove the point. The most satisfactory classifications now in use give important place as a cause for toxicity and degeneration to the two types only that for so many years have been easily recognized as sources of such changes; long before laboratory methods had achieved their recent excellence, the relationship was recognized and methods for the elimination of offending glands and reduction of their activity were followed by improvement and cure. The toxicity arising from adenoma of the thyroid almost certainly originates, not in the whole of the gland, but in the tumor of the thyroid itself. Proof of this can be secured by the fact that, after removal of the growth, and without interference or treatment of the remainder of the gland, entire cures can be obtained.

The history of toxicity from adenoma shows that, in almost all cases, there has existed for many years the nodular type of goiter, without symptoms, except possibly locally from mechanical pressure, until there begins very slowly to be evidence of voluntary muscular incompetence, possibly some renal fault, increased blood pressure, and particu-

larly a beginning or definite myocardial weakness. The degree and activity of this poisoning cannot be exactly estimated by any other method than that of the basal metabolic rate, so insidious is the onset and progress. Just what determines the occurrence and rapidity of this change from innocence to malignity is not definitely known, and even now the pathological laboratory does not answer the question to the satisfaction of all clinicians. In some instances the mere length of time the growth has been present seems to be a factor; possibly some local degenerative or irritative process may be responsible for increased production of the thyroid hormone in the adenoma, or increased absorption of this substance may be favored. Not all adenomas, even those present many years and of great size, ever become toxic, but competent authority would seem to indicate that, assuming the goiter of this type to have been observed at about thirty-five years of age, sixty per cent will proceed to toxicity by the sixtieth year.

Occupancy of some of the goiter regions of North America by a civilized population has produced several generations of people in whom colloid goiter is endemic and exceedingly common. The systematic prophylactic use of iodine is a comparatively recent practice. The generations in these regions that have reached middle age and farther have inherited thyroid glands that are replete with the presence and possibilities of adenoma of the thyroid, both fetal and acquired. The late history of thyroid surgery shows a very much greater number coming for surgical attention for toxicities arising from this source, so that it has become necessary to undertake surgery upon patients formerly not seen and even now not completely understood by all classes of their surgical attendants and consequently in very bad condition for operation because of advanced degeneration. Now that we understand the value of the estimates of these cases upon the basis of the basal metabolic readings, a great advantage is secured in that questionable cases will be brought to early operation. It is particularly to be emphasized that with all patients

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, April, 1925.

who are known to have adenomatous goiter and who are in the possible age of toxicity, there can always be secured a time for operation, should it become necessary, that is safe in performance and sure in cure.

There can be no doubt of the wisdom of prophylactic removal of a definite adenoma of the thyroid at a reasonably early age, and another generation will have learned the wisdom of treating both prospective mothers and children so that adenoma will be largely prevented from occurring at all.

In present practice in this region, the greatest problems of thyroid surgery are largely found in the group that is now between forty and sixty-five years of age in which toxic symptoms and effects are already apparent.

Formerly and until very recent years, the most difficult and dangerous surgical situations were in the exophthalmic group and the mortality was highest here. Lately, however, the condition of the patients with toxic adenoma, their age and the changes induced by the disease in essential and important organs, have given surgically a higher mortality than that of Basedow's disease. This difference is partly caused by the recently vastly superior preoperative preparation of exophthalmic goiter cases over that of a few years ago. But, also, it is due to the more advanced age of the adenoma patient, the insidiousness of the disease and the advanced degeneration of important organs that has occurred before its source is recognized and treatment instituted.

The prognosis in cases of toxic adenoma will be influenced most largely by the success of the estimate that can be made of essential integrity of the heart, the kidneys and the blood vessels, together with proper preparation of the patient for operation. It is not necessary to set forth that cure depends upon a reduction of the excessive production and absorption of the thyroid hormone, and that, to this time, no methods of treatment are as effectual as surgery. The mortality from this method has, of course, been enhanced by the difficulty of diagnosis before the basal metabolic rate, as a differential diagnostic method, came into general use. Previously in many of these patients the true nature of the condition could not be determined, as the symptoms occurred in elderly folk who might be expected to show sufficient degenerative changes in important organs to account for the symptomatology.

The preparation for operation should include support of the heart muscle, by means of large doses of digitalis over a period of about three days, together with sufficient rest in bed. The kidneys, if incompetent, will be benefited by this procedure, as well as by the increased water intake that should be insisted upon except where edema from either heart or kidneys has occurred. To improve morale and guarantee a certain restfulness that is essential, small doses of morphine may be occasionally employed. The period immediately prior to operation must be free from anxiety, utilizing morphine and hyoscine when necessary. The operation should be done preferably with a local anesthetic, in cases of high toxicity and grave visceral degeneration, and should guarantee the minimum disturbance of the patient by pain, fear, or loss of undue amount of blood. Rapidity and precision of technic are important essentials; drainage of the occasionally very free discharge of serum and blood is generally required in cases where the growth is large. After-care must include quiet, rest, continuance for two or three days of digitalis, and adequate water intake.

A most interesting phase of the treatment of this type of disease is that some apparently hopeless cases with visceral degeneration recover after removal of the offending thyroid, to an amazing degree of competency of the affected organs, and this ability to recover from secondary degenerations seems to be in many cases greater than from comparable effects from almost any other cause. It is not uncommon to see patients with this disease who present themselves with gross evidences of cardiac incompetency (albuminuria, enlarged liver and bloated ankles), after a proper regimen of preparation, operation and after-care, once more resume their accustomed occupations, even well after middle life, for several years without any cardiac symptoms. The situation will sometimes be changed from one in which the patient would certainly die in six or eight months, or be a hopeless invalid a little longer than that, to one in which he can live many years, still happily and without especially narrowed limits of activity.

The high mortality rate, however, is due to the impossibly difficult and dangerous situation to which these patients have come unnecessarily. A consideration of this phase of the question must be made in patients with simple adenoma so that these tragic outcomes are prevented.

In conclusion we wish to say the following:

1. Prophylactic treatment of a large part of our entire population, by iodine, will to some degree prevent the occurrence of adenoma of the thyroid.
2. Removal of adenomas before the years of possible or probable toxicity should be a recommended practice.
3. Individuals already having nodular goiters should consult their physicians early upon the advent of any toxic symptoms, even slight ones, and these should be recognized.
4. Operative measures should be undertaken only with adequate preparation, and with local anesthetic in the severe types.
5. Even in many desperate cases of severe secondary degeneration, the removal of the offending source may be followed by rather remarkable restoration to effective life, without a lasting or severely hampering condition.

THE AMERICAN ACADEMY OF PROCTOLOGY

Physicians have received letters inviting them to become charter members of the American Academy of Proctology of Evansville, Ind. The fee is ten dollars. The letters are signed W. G. French, Secretary-Treasurer. William Gale French holds a diploma from the Hahnemann Medical College and Hospital of Chicago, dated 1906. Medical Directories indicate that Dr. French has changed addresses many times since he was graduated. In 1906 he was at Brook, Ind.; in 1909 at Greensburg, Ind.; in 1910, Indianapolis; in 1912, Kingsburg and La Porte, Ind.; from 1914 to 1916, inclusive, he was in Chicago. Other records show that French was in Detroit in 1912 and 1913; in Evansville, Ind., and Chicago in 1920; and back in Evansville in 1923. In 1907, William Gale French and three others incorporated the "Harvey Medical College and Hospital" of Chicago (not to be confused with the Harvey Medical College of Chicago). The William Gale French Harvey Medical College changed its name to Jackson University in 1908; to Jefferson University in 1909; in 1912 the charter was dissolved. This so-called medical college apparently never had any actual existence as a teaching institution. The name of French has repeatedly appeared in the newspapers because of his connection with questionable activities and enterprises. In 1921, French appears to have been connected with the "National Health Laboratories," which advertised an alleged cure for piles. In 1923, William Gale French announced that he was "going to run straight." One year later, an advertisement of the "National Health Laboratories" appeared and the indications are that French was interested in this.

(*Jour. A. M. A., Sept. 12, 1925, p. 842.*)

CLINICAL AND RADIOLOGICAL DIAGNOSIS OF RICKETS AND SOME CONDITIONS SIMULATING THIS DISEASE*

WALLACE H. COLE, M.D., F.A.C.S.

St. Paul

All hospitals which take care of crippled children receive as patients a certain number of cases of rickets in the various stages of the disease. Cases are also admitted where the referring physician has made a diagnosis of rickets but where subsequent examination shows that this condition is not present, but that some condition simulating rickets in its symptomatology is the lesion. The opposite is also true at times and cases of definite rickets are received where some other diagnosis has been made. The conditions which it is desired to bring to your attention and the differential diagnosis of which will be discussed, are: (1) rickets; (2) syphilis; (3) osteogenesis imperfecta, and (4) achondroplasia or chondrodystrophia fetalis.

The question of rickets is one which can be dismissed rather shortly, as everyone is familiar with the classical signs of that disease. As is well known, it is a constitutional disease which occurs in childhood and infancy, characterized by nutritional disturbances which result in a deficient deposit of lime salts in the bone. The most characteristic changes are in the epiphyseal cartilages, which become increased in thickness and much more vascular than normal. Irregularity, both microscopically and macroscopically, of the epiphyseal lines, is also typical, and the shaft of the bone adjacent to the involved epiphyseal line becomes thicker, due to periosteal involvement. As a result of the interference with the lime salts in the bones, softening occurs and, secondary to this, deformities of many types, due, probably, mainly to mechanical causes. When the acute stage of the disease has subsided the lime salts are redeposited so rapidly in the bones that they frequently become much denser than normal, and ivory-like in hardness. The clinical diagnosis of rickets can be made on many points, the most important of which are: enlargement of the epiphyses, especially at the wrist; the so-called rosary on the front of the chest; the large head; Harrison's groove

*Read before the Minnesota State Medical Society, Minneapolis, April 28, 1925. This paper was given largely as a lantern slide demonstration. Only a very few of the slides shown are reproduced.

across the thorax; and the deformities of the extremities, usually of the knock-knee or bow-legged type. Fractures may occur. The roentgenological picture is very typical, but varies somewhat according to the stage of the disease. In the acute stage, the epiphyseal area is cloudy and not sharply out-

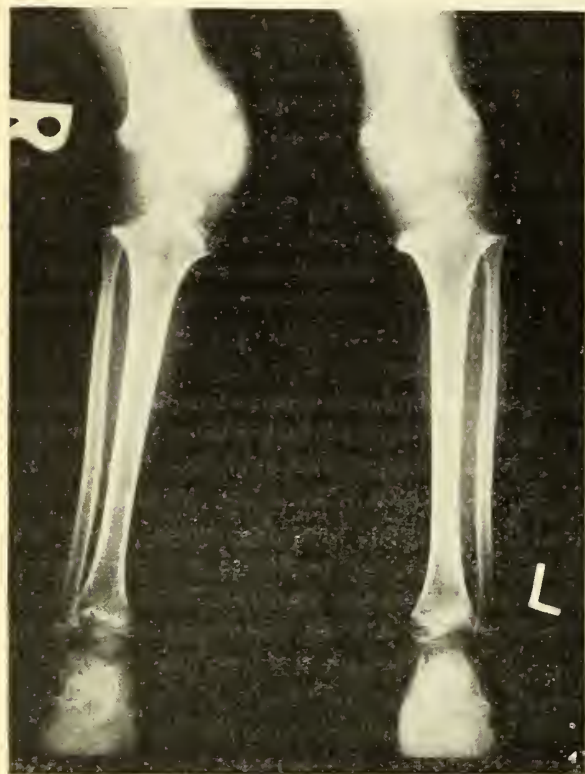


Fig. 1

lined, and the center of ossification in the epiphysis itself is mottled and uneven. The epiphyseal lines have a tendency to spread out and the end of the metaphysis assumes a saucer-shaped appearance. This saucer-shaped appearance is more prominent in the lower end of the tibia and the lower end of the radius than in the other bones.

Syphilis of the bones and joints in children is always of a congenital type and gives a picture which is sometimes difficult of differentiation, but which is usually very typical. The disease manifests itself in many ways, the most common ones being an osteochondritis at the epiphyseal lines, a periostitis of a localized or diffuse type, and a formation of gummata. The condition is usually multiple. The osteochondritis, involving as it does the epiphyseal lines, simulates, to a certain extent, rickets and scurvy, but one always finds other signs

of the syphilitic infection and the roentgenological examination is usually differential. Pain is always present with this type of lesion in the early stages, although later this disappears. Deformities of the affected bones sometimes develop due to irregular involvement of the epiphyseal lines. The thickening and increase in density of the shafts of the bones involved in a syphilitic periostitis is so typical as to need no description, but gummata may cause more or less destruction of bone and are not infrequently difficult to distinguish from a mild pyogenic osteomyelitis. Joint lesions, when present, are usually in the form of a synovitis, serous in character, and of an acute or chronic type.

The roentgenological picture varies with the stage of the disease. Usually there is a formation

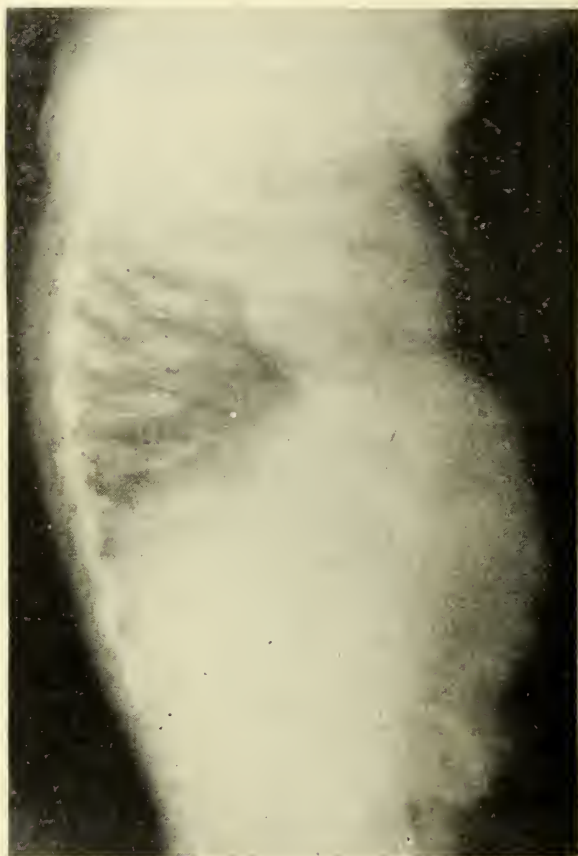


Fig. 2

of new bone of the periosteal type and a marked disturbance of the epiphyseal line, the changes being on the diaphyseal side. There is never any saucer-like expansion, as seen in rickets, and the

epiphysis itself is normal. The epiphyseal line may present an eaten-away appearance and circumscribed areas of softening and destruction are commonly present under the periosteum just back of the epiphyseal line. Atrophy of bone does not occur and fractures are therefore uncommon.

Osteogenesis imperfecta, a condition which is also described under various other names such as fragilitas ossium, osteopsathyrosis, and osteomalacia, the latter being probably incorrectly used in this connection, is of unknown origin and is characterized by a marked fragility of the bones, leading to repeated fractures. The most typical clinical fact leading toward a diagnosis is the history of repeated fractures, the result of slight or almost negative injuries. These fractures always heal, and callus formation may be small or large, but deformities sometimes occur as the result of malunion and bending of the callus at the site of fracture. The sclera are frequently very blue in these children. The roentgenological picture is fairly typical and shows a marked atrophy of the bone,

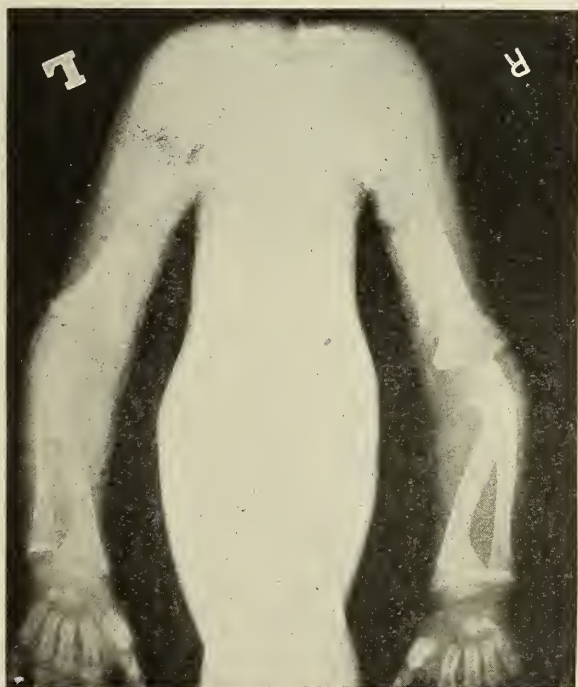


Fig. 3

the shadows sometimes being so light that they approximate that of the soft parts. There are no joint or epiphyseal changes and the multiple fractures can be seen.

Achondroplasia gives a clinical and roentgenological picture which in a typical case is difficult to confuse with other conditions. There are, however, a number of cases which must be classified as atypical achondroplasias and it is this latter group which is frequently confused with rickets. Achon-

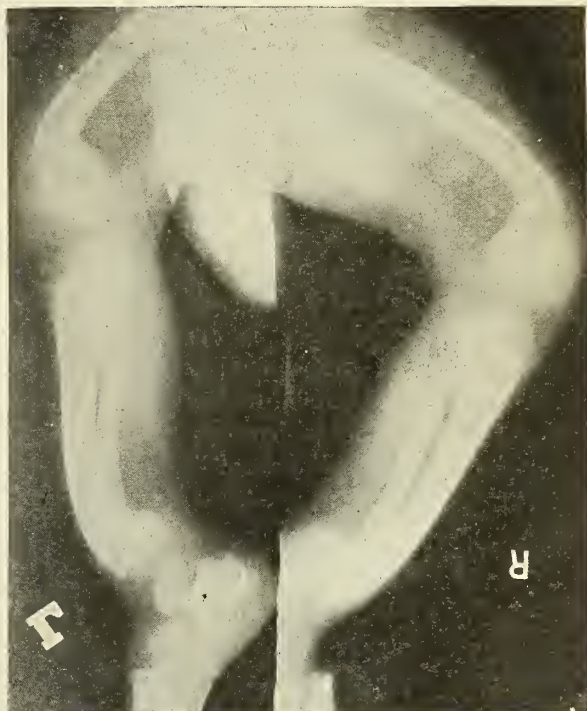


Fig. 4

droplasia is a congenital condition due to some unknown cause or causes, the most accepted theory being that the underlying factor is a tight amnion, although disturbances of the endocrine glands, infections and nutritional disturbances are sometimes blamed. The condition is usually noticeable at birth, but may not become evident until as growth occurs a disproportion between the length of the extremities and the trunk is seen. The early union of the epiphyses is typical. The main diagnostic features are the short extremities and long trunk, enlarged and sometimes distorted joints, depression of the nasal bridge, and the so-called trident hand, due to divergence of the metacarpals. Some of these may be absent, however, in the atypical cases.

The roentgenological picture shows what is probably a normal thickness of the bones of the extremities with a marked shortening, in the typical

cases, and various distortions of the epiphyses themselves (Fig. 1). Apparently periosteal bone formation is normal, but epiphyseal bone formation retarded, the epiphyses being greatly deformed and ossification markedly disturbed. All bones of both the upper and lower extremities may be involved and many areas of osteoporosis are seen. The bodies of the vertebræ may become wedge-shaped with a marked disproportion between the amount of bone present and the inter-vertebral cartilages, the latter being greatly increased in thickness (Fig. 2).

A few typical cases of the above conditions will illustrate the more important facts:

A. O., a girl two years old, had a negative history, except that deformities of both legs developed early in life, but were not present at birth. Examination showed a poorly developed child, with marked deformities of both lower extremities, there being very noticeable curvatures in both femora and corkscrew-like curves in both tibiae. The epiphyses throughout the body were enlarged, there was a definite pigeon breast and a rosary was palpable. Clinically, this was very definitely a case of old, severe rachitic deformities. The roentgenograms showed bowing of the involved bones, and cupping at the epiphyseal lines. The shafts of the bone were thick and showed new periosteal bone formation. The spine was apparently negative. A definite diagnosis of rickets could be made on these pic-

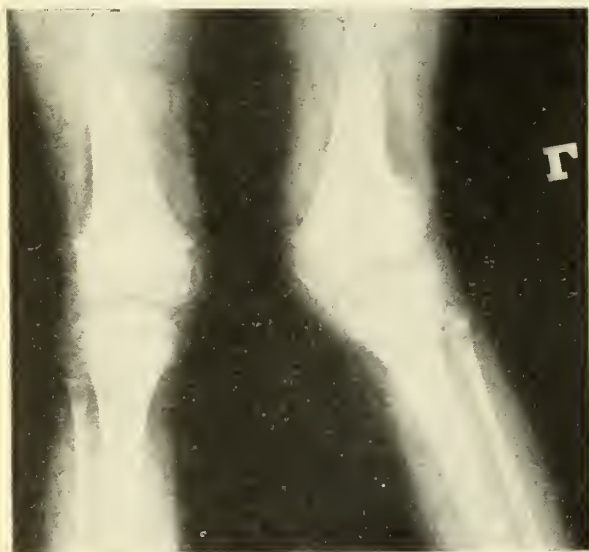


Fig. 5

tures, the deformities of the bones and the saucer-like depressions at the epiphyseal lines being almost pathognomonic (Figs. 3 and 4).

E. W., a six-year-old girl, was sent to the hospital by her physician with a diagnosis of tuberculosis of the left knee.

The family history was negative and the past history showed nothing except a conjunctivitis when four years of age. Complaint on admission was knock-knee, bilateral, more marked on the left, of about four months' duration, with severe pain on walking. Examination showed the bilateral knock-knee, very slight on the right, an interstitial keratitis, teeth of the Hutchinsonian type and enlarged glands



Fig. 6

in the cervical and inguinal regions. The patient could not maintain her balance when asked to walk alone. The Wassermann was positive. As a result of these findings a clinical diagnosis of syphilitic osteochondritis at the lower end of the femora was made. The roentgenograms showed the knock-knee deformities and a lesion of the epiphyseal lines at the lower ends of the femora, more marked on the left, with some destruction of the metaphysis proximal to them. There was an increase in density of the metaphysis around this destructive area (Fig. 5). Diagnosis: Syphilitic epiphysitis or osteochondritis.

A. O., a girl three years of age, was sent in with a diagnosis of rickets. Her history showed repeated fractures of the right humerus, the first one having been sustained at the age of four months. There was a complaint also of bending of the right leg. Examination showed rather marked anterior bow of the right tibia, a deformity of the right humerus, some enlargement of the head, questionable epiphyseal enlargement and a rather marked blueness of the sclera. A diagnosis of osteogenesis imperfecta was

evident. Roentgenograms were difficult to take on account of the disposition of the child, but showed enough to confirm the diagnosis. The thin cortex of the bone, multiple fractures, and the bowing were typical (Fig. 6).

F. F., aged 1 year, was admitted on account of multiple fractures. The first fracture occurred when six weeks old and was of the left tibia. Since that time fractures of the



Fig. 7

right and the left humerus, of the ribs, of the femur and tibia had also occurred. The mother stated that even with the most careful handling fractures could not be prevented. Examination showed the typical blue sclera and bowing of both humeri, femora and tibiae, with apparently a fairly recent fracture of the left femur. There could be no doubt about the diagnosis of osteogenesis imperfecta in this case, and the roentgenological picture, although difficult to take and not satisfactory, showed marked rarefaction, bowing, and fracture of the femur was unmistakable (Fig. 7).

L. K., ten years of age, was admitted to the hospital with a diagnosis of rickets. The history showed that there was a bowing of both tibiae noticed early in life and that the child never had been able to walk normally. It was also noticed that the bones of the leg were thicker than normal and when the patient was about three years of age it was observed that the elbows could not be completely extended. The main complaint, aside from the deformities, was a rapid tiring on walking. Examination showed a rather marked bowing of both legs with a prominence of the upper end of the fibulae and of the lateral condyles of

the tibiae. Both the arms and legs were shorter than normal, the buttocks were prominent, there was a valgus deformity of both feet, and the fingers were short and stubby and divergent. Roentgenological examination showed rather marked deformities of the epiphyses, especially of the elbows, wrists, knees and ankles. The upper ends of the femora were also deformed and the acetabula were irregular. The pubic bones were not united to the ischia. The anterior bowing of the tibia was apparently due to distortion of the epiphyses. A diagnosis of a somewhat atypical achondroplasia was made (Fig. 8).

A. J., a girl, thirteen years of age, came into the hospital without a diagnosis. The history showed that when one year of age the joints seemed to be larger than normal and that a maldevelopment of the bones had become more apparent as time had passed. The child had stayed small and the musculature had never properly developed. The examination showed a badly deformed child, the deformities involving practically the entire body. Feet and hands were large and there was a marked bulge of the sternal region, above an exaggerated Harrison's groove. The extremities were apparently shorter than they should be and the ends of all the long bones were enlarged.

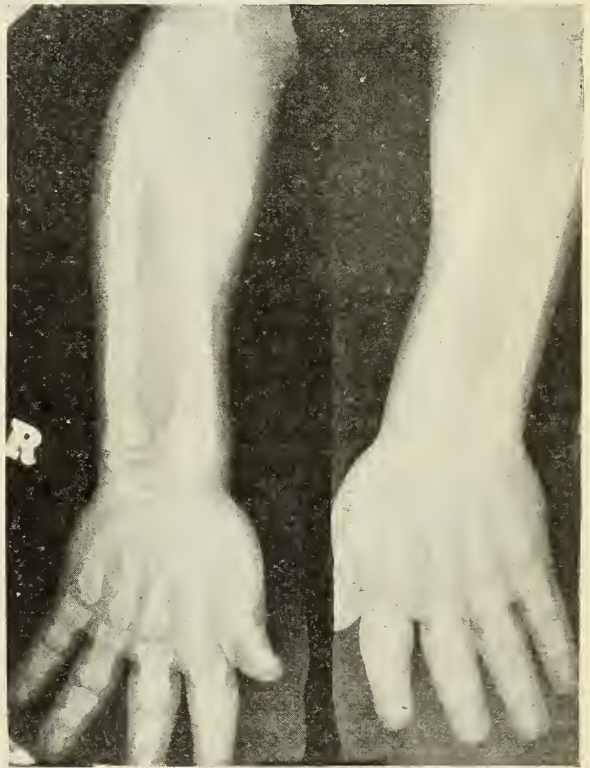


Fig. 8

Roentgenograms showed shortening and thickening of both humeri with distortion at the ends of the bones. The epiphyseal lines were indefinite. There was marked distortion of the lower ends of the radii and ulnae, with small centers of ossification in the carpal bones and with some

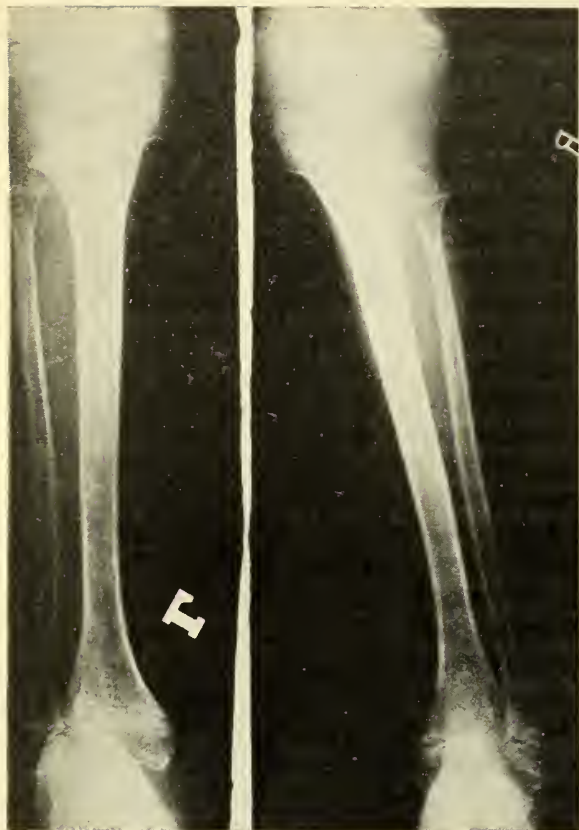


Fig. 9

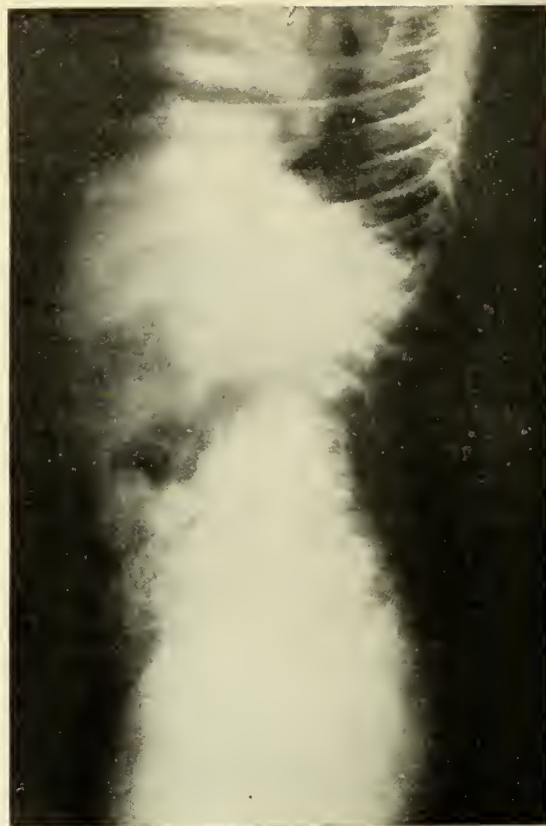


Fig. 11

of these centers not yet present. The metacarpals were short. The lower extremities showed similar pictures with an additional marked irregularity in bone formation in the feet (Figs. 9 and 10). The spine showed narrowed zones of ossification in the vertebræ with widened discs, and some wedge-shaped formation (Fig. 11). A diagnosis of atypical achondroplasia was made.



Fig. 10

DISCUSSION

DR. CHARLES A. REED, Minneapolis: I fear we have rather hazy ideas regarding the differentiation of rickets, congenital lues, achondroplasia, osteogenesis imperfecta, scurvy and osteomalacia. Dr. Cole has cleared up this subject amazingly in his short but very comprehensive paper. In fact, he has left little to add and nothing to criticize.

In the classification of disease the pathologist and clinician must select typical cases showing classical symptoms. So long as our case is clean-cut and typical it is ordinarily easy to fit it into the scheme. Unfortunately, many cases are not typical. The picture may vary from the average, or more than one condition may be present. Rickets and congenital lues may co-exist. It may be difficult to say if the child has not scurvy as well as rickets. I think it well to focus our attention on the main x-ray changes so well brought out by Dr. Cole. A brief résumé may be of assistance.

In rickets, the epiphyseal line is thick and wide, and the end of the diaphysis saucer-shaped and irregular.

Lues does not change the thickness of the epiphyseal line, but the diaphyseal end is punched out at the edge.

Achondroplasia gives a thin epiphyseal line, with smooth,

sharp bone edges, while osteogenesis and the other conditions mentioned give no epiphyseal changes.

As to the shaft of the bone, in rickets it is atrophied early and dense and deformed later. In lues the periosteal enlargement is characteristic, while in achondroplasia the shaft is short, but otherwise normal. In scurvy, the shaft gives the characteristic change, a subperiosteal hematoma, which may calcify and simulate sarcoma. In osteogenesis, the atrophied bone is the diagnostic point.

There is one clinical symptom of rickets which is so often misinterpreted that I cannot refrain from mentioning it. The epiphyses of acute rickets are tender and the child refuses to bear weight on this account. Many mothers think their child is paralyzed and the term "pseudo-paralysis" is applied to this condition. The soreness disappears as soon as the acute stage is passed.

I hope that Dr. Cole will have his interesting pictures published in full, as we will all desire a permanent record of them.

THE AMERICAN ASSOCIATION FOR MEDICO-PHYSICAL RESEARCH

This is another society catering to the twilight zone of professionalism. It recently held what is claimed to be its fourteenth annual convention. Little appears to have been heard of this organization until three years ago, when the Albert Abrams fakery was at its zenith. In the meeting held that year, no small time was devoted to the "Electronic Reactions of Abrahams." The Medical Association for Medico-Physical Research was organized in 1911 by the outstanding quack of the century—Albert Abrams. It was originally known as the American Association for Spondylotherapy. From a study of the records of some of those whose names appear on the program of the society's annual meeting about to be held, it should not be difficult to judge the probable scientific status of the American Association for Medico-Physical Research.

(*Jour. A. M. A., Sept. 19, 1925, p. 919.*)

ROBES' ANTI-RHEUMATIC INJECTIONS

While the advertising for Robes' Anti-Rheumatic Injections, which is sent out by Robes Intravenous Products, Inc., leads one to believe that the product is some form of streptococcus vaccine, an advertisement containing a report of the analysis of the product indicates that the preparation consists of nothing more than minute amounts of mercuric chlorid and traces of guaiacum in a physiologic solution of sodium chlorid containing about seven per cent of alcohol. Neither mercuric chlorid nor guaiacum is recognized as having antirheumatic properties. The preparation has not been accepted for New and Non-official Remedies.

(*Jour. A. M. A., Sept. 12, 1925, p. 845.*)

TETANUS ANTITOXIN

To secure protection in severe cases of injury it is usually advised to give a second injection of antitoxin ten days after the primary one.

(*Jour. A. M. A., Sept. 26, 1925, p. 923.*)

SOME ERRORS IN CARDIAC DIAGNOSIS*

MORRIS H. NATHANSON, M.D.

Minneapolis, Minnesota

The diagnosis of diseases of the heart is often attended with difficulty. Mistakes are commonly made, first, in diagnosing heart disease, where there is no true cardiac pathology, and second, in diagnosing a normal heart in cases where later developments show pathology is present. These difficulties arise from the fact that practically all the symptoms and signs ordinarily considered as evidences of a diseased heart may occur in individuals possessing the organ anatomically intact in all its structures. Thus, a large proportion, possibly 50 per cent, of individuals presenting symptoms such as respiratory distress, palpitation, and precordial pain, and also physical signs, especially murmurs and irregularities, prove to be non-cardiacs on careful study. A large number of these cases have at some time been diagnosed as cardiopaths. It is true that with added experience, one can often, by a more thorough analysis of these signs and symptoms, discover certain features which differentiate the cardiac from the non-cardiac. There is furthermore a fairly large group lacking the usual signs in their history and physical examination in whom definite pathology is present. We may often obtain great aid in diagnosis by the use of additional methods, such as the electrocardiograph and x-ray.

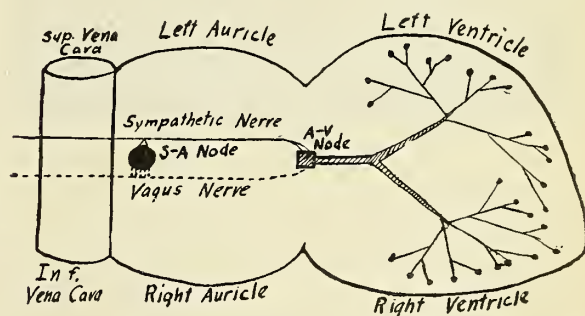


Fig. 1. Schematic representation of the specialized tissue in the heart, showing the distribution of the conducting system and nerve supply.

I wish to present a small group of cases illustrating the value of these methods. This group consists of cases in which errors of two types might easily occur: (1) a group in which cardiac pathology might be suspected because of abnormal

*Read before the Soo Surgical Society, December 10, 1923.

physical signs, chiefly irregularities; (2) a smaller group, in whom the absence of certain physical signs might tend to exclude cardiac disease, though it is actually present.

In the first group are a few, selected from a rather large number of cases that present themselves with a variety of symptoms and a disturbance in rate or rhythm of the heart. The symptoms

that the arrhythmia and symptoms may disappear from time to time or may vary in nature. Furthermore, and this is of importance, these conditions are not later followed by any manifestations of heart failure. Our clinical impression then would be, that these disturbances are not due to organic disease of the heart. We need not rely entirely, however, on our clinical evidence that this type

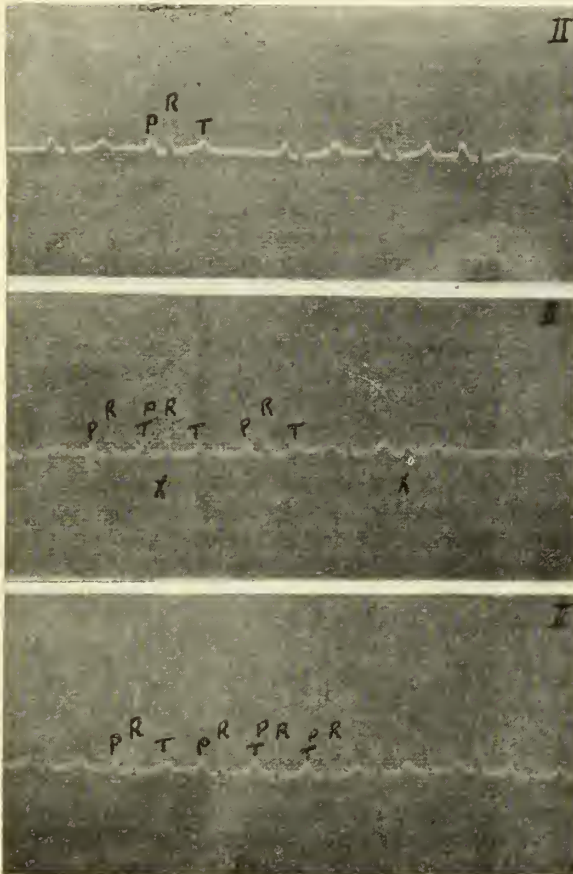


Fig. 2. Three electrocardiograms taken within five days. Upper shows marked sinus arrhythmia; middle shows frequent auricular extrasystoles; and lower, paroxysms of auricular tachycardia.

are commonly: (1) consciousness of the heart-beat (rapid or irregular); (2) precordial distress of various types; (3) dizziness; (4) fainting spells, and (5) respiratory distress. The irregularity of the heart may not be constant, being absent at times, and may vary from time to time. Its exact nature may be revealed only by the use of the electrocardiograph. These individuals often have had their attention called to their heart, and many have the impression that a serious affection of the heart is present. Further observation reveals the fact

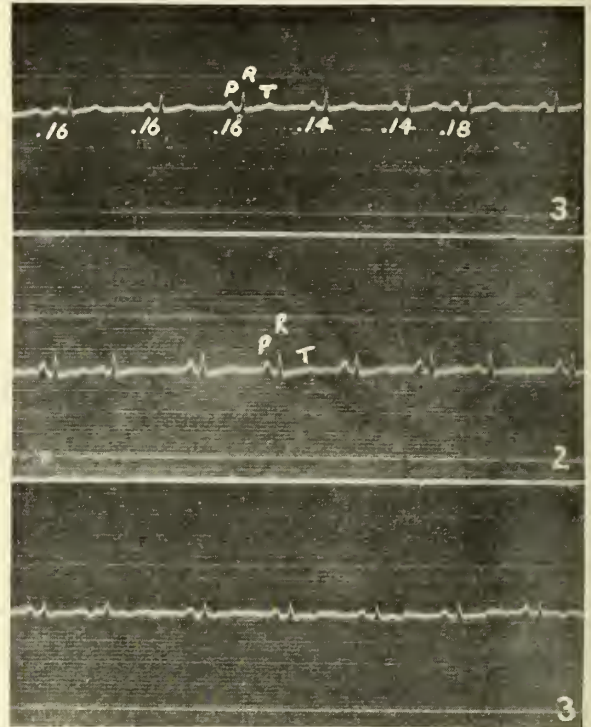


Fig. 3. From a case with an irregular pulse and symptoms of palpitation and dizziness. Note the irregularity associated with variation in contour of the P wave and varying P-R interval.

of case, in spite of marked cardiac irregularities, is not associated with organic cardiac disease. A study of the mechanism of the heart-beat, as it is now understood, demonstrates the fact that irregularities of any type may arise without organic change in the heart itself. A knowledge of this mechanism is of importance in the understanding of these cases, and it would be worth while reviewing briefly our progress in the study of the exact nature of the heart contraction.

For a considerable length of time all that was known concerning the function of the heart was its contractility. It could easily be seen that the fibres shortened when the heart was stimulated. The mechanism by which these contractions oc-

curred at a certain rate and with a certain rhythm, and by which the sequence of events in the cardiac cycle took place in an orderly, systematic manner was not known at this time. In more recent years it has been found that the heart muscle possesses properties other than contractility. It was found that it could not only contract to external stimuli, but could initiate impulses, which resulted in spon-

tive, that is, the point at which the impulses arise, is called the sinus node (S-A node). This bit of tissue, the pacemaker of the heart, lies at the junction of the superior vena cava and the right auricle. The excitation wave proceeds from this point through the auricle. The connection between the auricle and ventricle consists of a node of specialized tissue (A-V node) and an extension of this

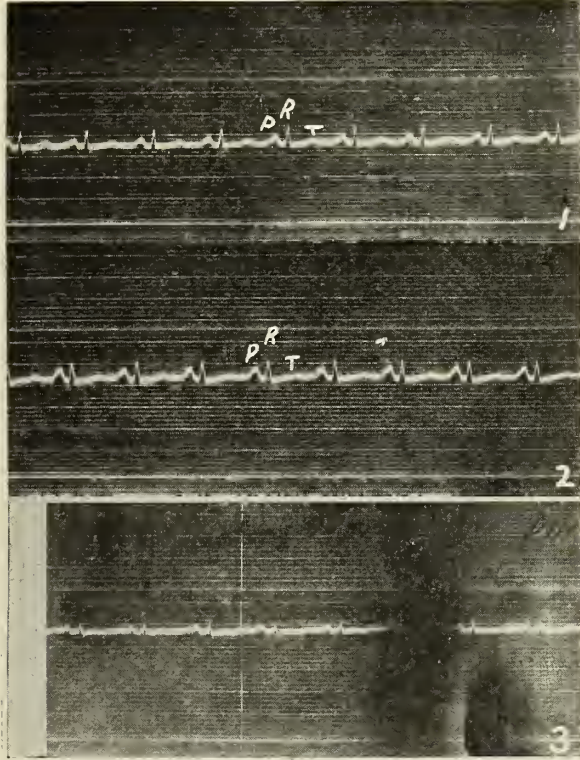


Fig. 4. Same case after atropine sulphate gr. 1/50. Regular rhythm and uniform P and P-R intervals.

taneous contraction. Furthermore, it was found that these impulses arise at a definite point and spread through the heart in a definite manner, activating the entire heart muscle. It was thus, as a result of a rather long series of researches, that we have arrived at our present-day understanding of the mechanism by which the impulse, exciting the heart contraction, arises and by which it spreads throughout the heart. It is through the activity of this system that the heart owes its orderly rhythmic contraction, and it is through disturbances in this mechanism that disorders of the heart-beat arise.

Figure 1 is a schematic representation of these specialized tissues which initiate and conduct the excitation wave which precedes the heart contraction. The first portion of the heart to become ac-

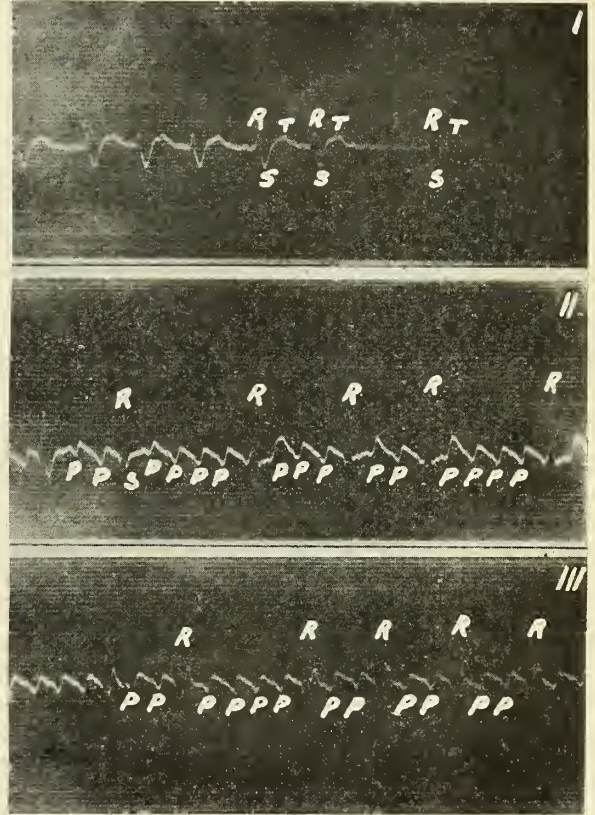


Fig. 5. From a case of auricular flutter. The auricular oscillations are abnormal, and are two to four times as frequent as the ventricular.

node into the ventricle, called the bundle of His. This bundle passes on the right side of the interventricular septum, gives off a left branch, which pierces the septum, and is distributed to the left chamber. These two main trunks break up into fine ramifications, which form an interlacing network just beneath the endocardium, and is distributed to the muscle fibres. An orderly rhythmic cardiac contraction depends on a normal function of this system, and disturbance of rhythm must always be studied in relation to disorders of this mechanism. It is obvious that changes in the heart muscle may involve portions of this specialized tissue, and thus produce arrhythmias. However,

and this is of great importance in the understanding of irregularities, disorders of this mechanism may arise entirely from extra-cardiac sources. As will be seen in the diagram, fibres from both the vagus and sympathetic nerves are distributed to these tissues. Impulses passing down through these nerves have a profound effect on the activity of the conducting system. In a general way, vagus

stomach or intestine, may give sensations as a result of disfunction due entirely to faulty enervation.

In the case of the heart we have an accurate, graphic method for studying such changes. Various investigations, both clinical and experimental, have shown that the electrocardiogram, which graphically represents the activity of the conducting system, may be markedly altered by nerve

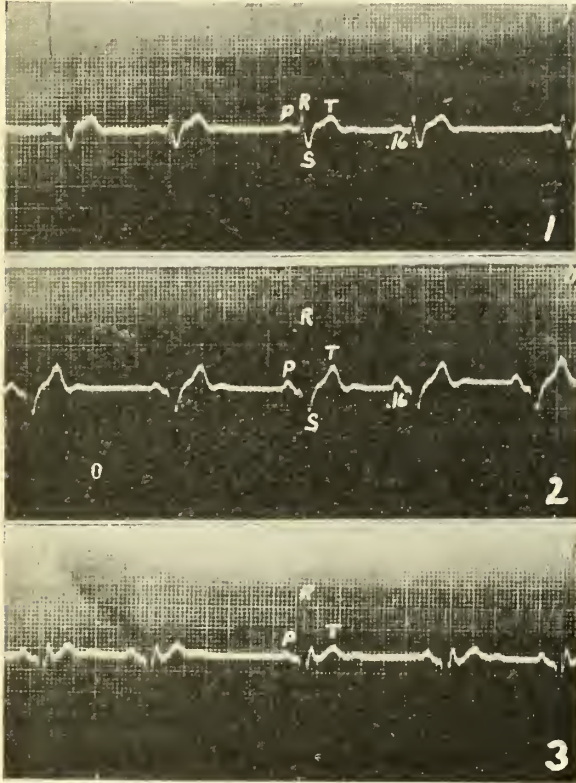


Fig. 6. Restoration of normal rhythm. Marked sinus arrhythmia present.

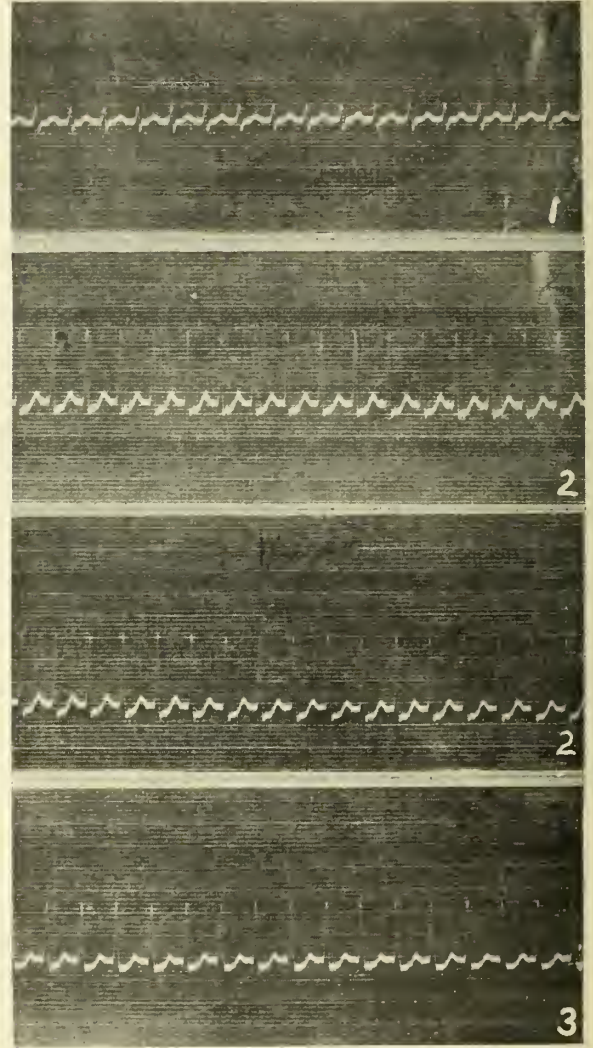


Fig. 7. From a case of paroxysmal rapid heart action. The rate is 200 and the impulses arise away from the sinus node, probably in the A-V node.

stimulation depresses the properties of excitation and conduction in these tissues, while the sympathetic has an opposite action. These two antagonistic nerves are in tonic activity, that is, impulses are continually passing down them to the heart, maintaining a normal function of the conducting system. When there is a disbalance in this antagonism there is a resultant disturbance in the activity of the conducting system, and disorders in rate and rhythm arise. This is not a new conception, for it is generally now known that any portion of the viscera, though anatomically intact, may function abnormally as a result of disturbances in enervation. Thus, the pupil, the bronchi, salivary glands,

stimulation or depression, and may result in as marked changes as occur in true disease of the heart. We are justified, then, in concluding the following: (1) cardiac irregularities result from disturbances in the functioning of the conducting system; (2) dysfunction of the conducting system

may result entirely from faulty enervation; (3) cardiac irregularities may then be indicative of abnormal enervation only, and not of organic change in the heart.

I will mention briefly here a few cases showing various types of arrhythmias associated with symptoms, which can be explained entirely on the basis of abnormal nerve control to the conducting tissue.

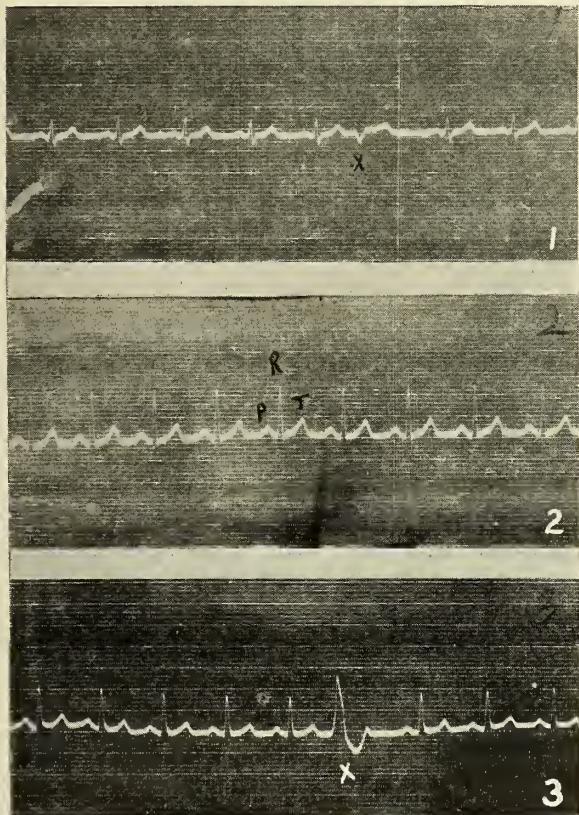


Fig. 8. Electrocardiogram two hours later. Normal rhythm established, rate 100, occasional ventricular extrasystole.

Case 1. A young woman, aged 24, two months pregnant. She has been told that a heart condition exists, and wishes to know whether the completion of pregnancy will be a serious undertaking. Past history shows a period of rapid heart action two years ago, following a severe emotional upset. Since that time she has had spells of dizziness, fainting, and consciousness of the heart-beat. General examination is negative, except for asthenic type and a cardiac irregularity, which varied from time to time. Figure 2 shows three electrocardiograms. In the first there is a marked sinus irregularity, a definite vagus effect. The record five days later shows frequent extrasystoles, arising in the auricle. The third shows paroxysms of rapid heart action, rate of 150, interrupting the normal rhythm. These contractions arise in the auricle outside of the node, and can be explained by depression of the node through increased vagus tone. At the time this tracing was being

taken the symptoms of palpitation and dizziness were very marked. This irregularity could easily be explained on the basis of disturbance of enervation. The patient was told that her symptoms were not due to a diseased heart. She completed her pregnancy without any difficulty.

Case 2. A young woman with similar symptoms and a cardiac condition suspected. Her pulse at times seemed totally irregular, and auricular fibrillation might have been considered. The electrocardiogram (Figure 3) shows an

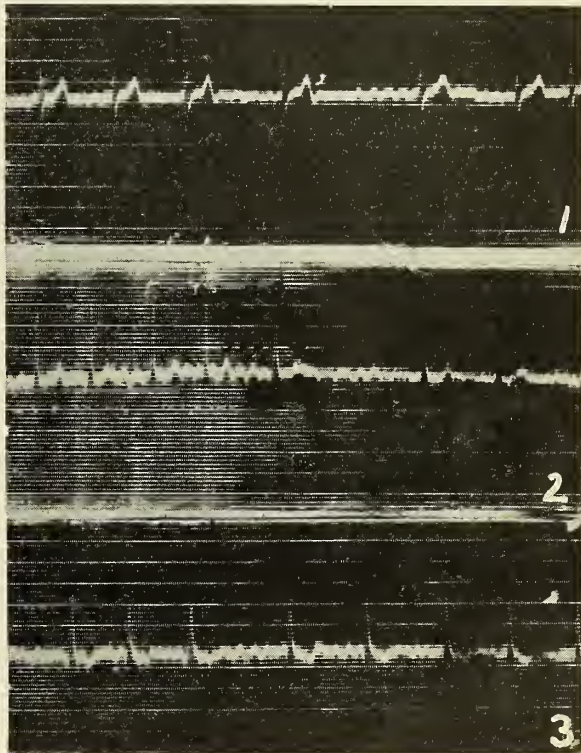


Fig. 9. Total irregularity due to auricular fibrillation in a heart otherwise normal. P wave is absent and is replaced by fine irregular oscillations, produced by the fibrillating auricle.

auricular wave (P) which varies in contour markedly, and there is a varying P-R interval. This suggests an unstable or shifting cardiac pace-maker. The impulses do not all arise from one site and therefore the irregularity. It has been demonstrated that such a condition may arise from alteration in vagus tone. The vagus effect is well shown in this case. Figure 4 shows the change after a hypodermic injection of atropin sulphate, gr. 1/50. The rate is somewhat increased, the rhythm is now absolutely regular, and the P waves are uniform in appearance. This indicates that the sinus node (vagus effect now broken by atropin) has complete control over the initiation of the cardiac impulse. This therapeutic test shows that this is a purely neurogenic irregularity.

Case 3. A middle-aged man of fifty-four complaining of dizziness and shortness of breath. Before coming under observation a rapid irregular heart had been found, and he

sized again that there is sufficient evidence, both clinical and physiological, that any type of cardiac irregularity may be present in a heart anatomically normal. A diagnosis of myocarditis cannot be based on the presence of an irregularity alone, for with our present understanding of the mechanism of the heart-beat, and the effect of the cardiac nerves, any irregularity may be explained on the basis of a disturbance in innervation.

Another physical finding which is commonly misinterpreted and which results in diagnostic errors, is the presence of murmurs. With the introduction of the stethoscope and the development of auscultation, great emphasis was laid on the presence of extraneous sounds in the heart. They were found to occur in association with cardiac disease, and this led to the erroneous conclusion that murmurs

under certain conditions, murmurs may be found in as high as 50 per cent of those examined. It is true that some murmurs, especially diastolic, usually mean some true defect in the heart. In spite of all these observations, diagnoses of heart disease are still made merely on the presence of a systolic

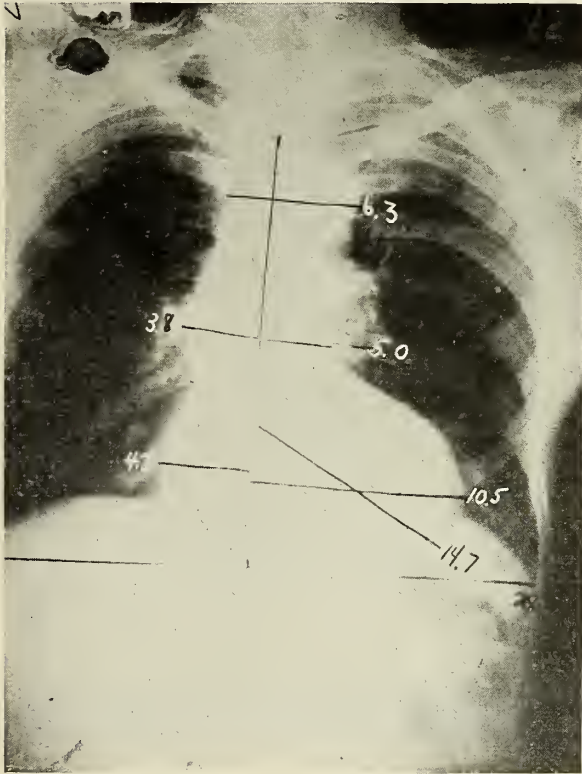


Fig. 12. Dilatation chiefly of left ventricle. Note the boot-shaped configuration of the heart. Aortic dilatation also present.

were always evidence of cardiac pathology. There have been many observations to show that certain murmurs, at least, occur in individuals who never show any evidence of heart disease. Various studies on large numbers of normal individuals, as in college or army examinations, have shown that,

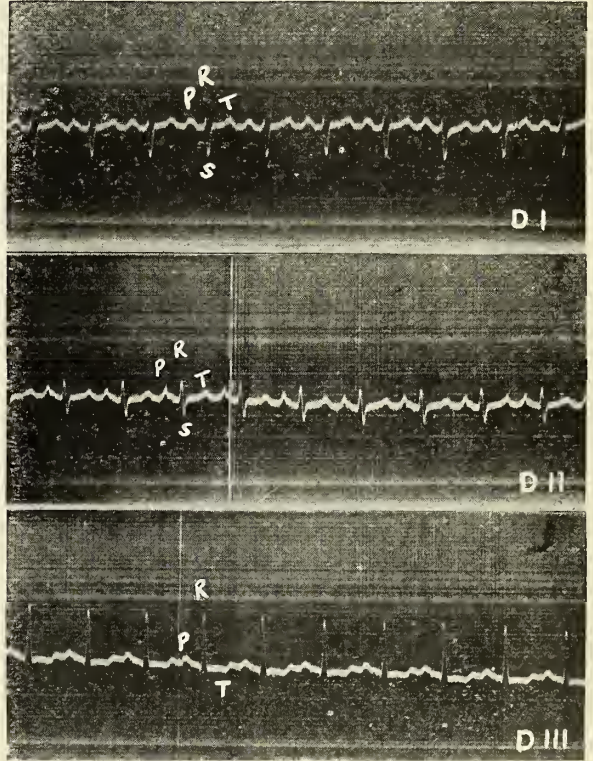


Fig. 13. Electrocardiogram from a case of mitral stenosis. The downward initial ventricular deflection (S) in Lead I, and upward deflection (R) in Lead 3, are characteristic of right ventricular preponderance.

murmur. A murmur associated with definite evidence of cardiac enlargement is, of course, significant. The presence of an enlarged heart cannot always be determined by physical examination alone. Here the roentgenogram and the electrocardiogram are of great value. Figures 11 and 12 are illustrations of cardiac enlargements, the first being chiefly that of the right ventricle; and the second, a left ventricular type. Electrocardiograms also usually give evidence of enlargement of one or the other chamber of the heart. Figure 13 is the tracing of a case of mitral stenosis, showing a definite right preponderance, and Figure 14 shows a left preponderance associated with arterial hypertension. These additional methods are often necessary to evaluate the importance of a murmur. If neither

shows any abnormality, great doubt is thrown on the significance of this physical finding.

It is not only true that a diagnosis of heart disease cannot be made on the presence of a murmur alone, but it is also true that the absence of a murmur does not exclude cardiac pathology. This is especially the case in the non-valvular types of heart disease, usually associated with hypertension. A study of a series of these cases in the stage of advanced heart failure revealed the interesting fact that almost 50 per cent have no murmurs, or at least they have no constant murmurs. It is obvious, then, that if one relied on the presence of murmurs alone, true cardiac disease would often be overlooked. In these cases the electrocardiogram often shows indications of myocardial change. These electrocardiographic signs result from an

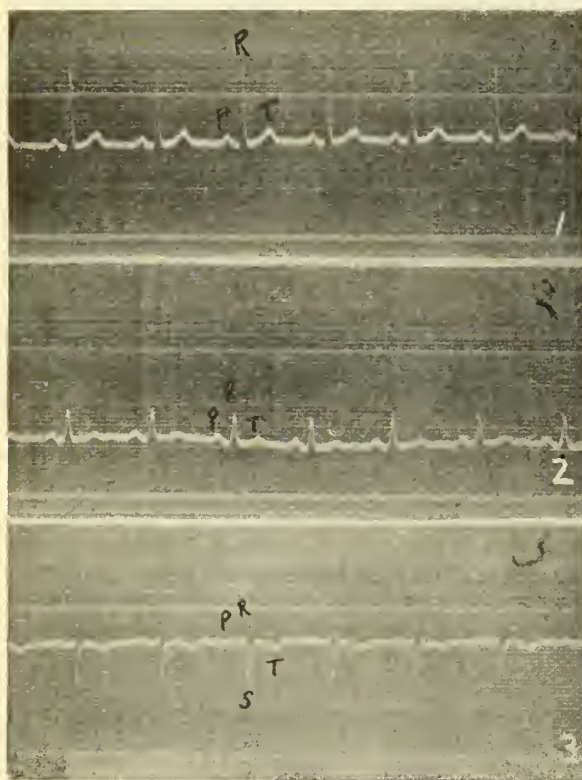


Fig. 14. Electrocardiogram from a case of hypertension. Left ventricular preponderance characterized by upward deflection (R) in Lead 1 and downward deflection (S) in Lead 3.

alteration in the path of conduction through the ventricle, brought about by the pathological changes in the muscle. This produces changes in the ventricular portion of the electrocardiogram, Q R S and T. These consist of a widening and

notching of the Q R S and a flattening or inversion of the T. Figure 15 shows the notching and widening of the Q R S, which are considered as evidences of block in the ventricle. In microscopic sections of hearts showing these abnormalities, there is frequently found a diffuse fibrosis in the ventricular muscle. This type of electrocardiogram is not a great rarity and it must be emphasized that it occurs often in hearts with regular rhythm and in the absence of murmurs. Figure 16 shows an electrocardiogram of a case of hypertension. There is a left ventricular preponderance and also inversion of the T in Lead 1. The left preponderance is quite a constant finding in hypertension and results from hypertrophy of the left ventricle. The inversion of the T, however, seems to occur only in the later stages and usually when the heart has begun to

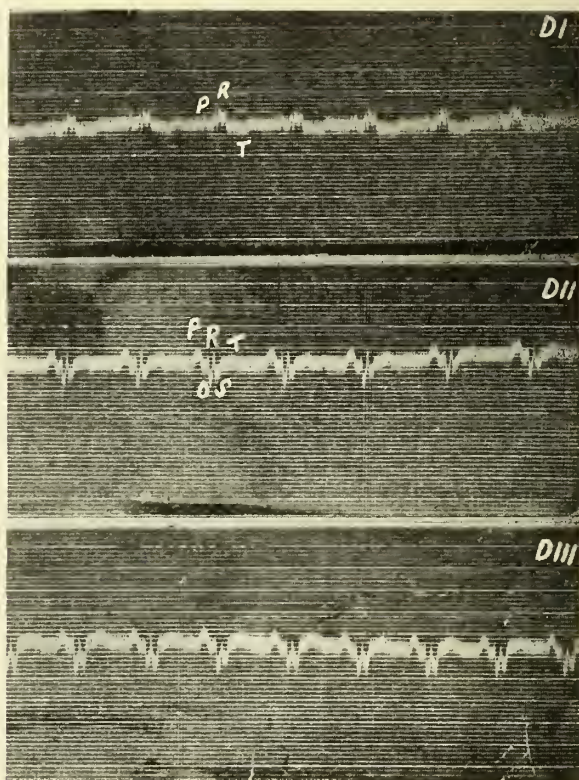


Fig. 15. Electrocardiogram associated with intra-ventricular block. The involvement is considered to be in the finer arborizations of the conducting system. The chief features are the low amplitude of the waves, and the marked widening and splitting of the QRS.

show signs of exhaustion. A study of this abnormality by Willius seems to indicate that it is of serious prognostic significance. Figure 17 shows an electrocardiogram from a case of angina pectoris. There is a deep inversion of the T wave in

Leads 2 and 3. This type of electrocardiographic abnormality seems to be quite constant in angina. Since this condition usually presents few if any

obtained by these methods is all-important for correct diagnosis. The electrocardiogram and x-ray will not substitute for the simpler procedures, but,

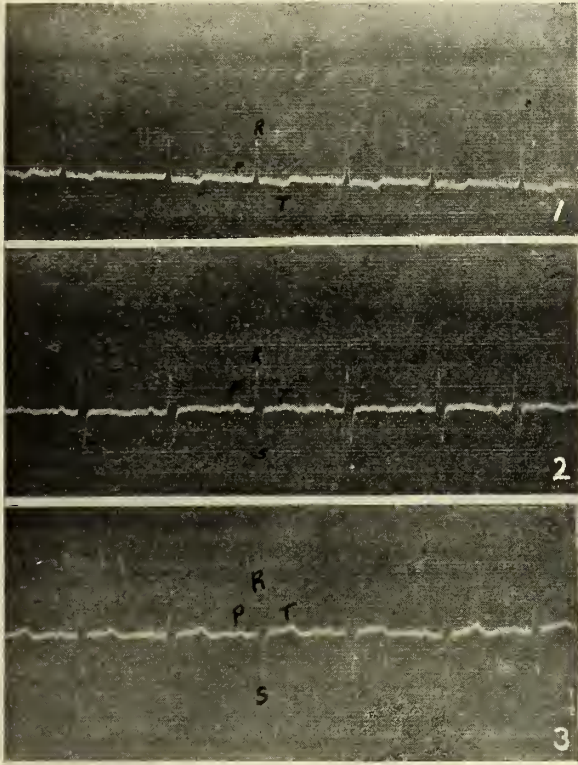


Fig. 16. From a case of hypertension with symptoms of cardiac exhaustion. Left ventricular preponderance and inversion of T and Lead 1.

suggestive signs, the electrocardiogram may be of great value in diagnosis.

In the presentation of the above cases, it is not intended to minimize the importance of a careful history and physical examination. The older and simpler methods are still of the greatest value in diagnosis, and the proper interpretation of the data

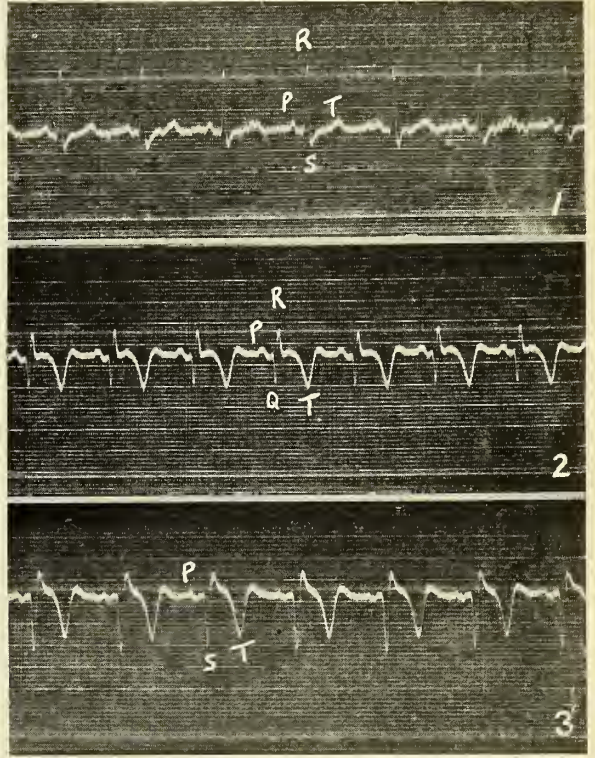


Fig. 17. Deep inversion of the T in Leads 2 and 3, in a case of angina pectoris.

in conjunction with them, will be of great aid in accurate diagnosis. In the presentation of these cases we have attempted to show that a more accurate interpretation of certain physical signs, especially cardiac irregularities and murmurs, may be obtained by these additional methods of diagnosis.

NOTE: I am indebted to Dr. Henry L. Ulrich for the opportunity of presenting these cases.

For the unscientific extravagances to which his doctrine has led him. Bernarr Macfadden, U. S. apostle of body-worship, blatant exponent of "physical culture," has more than once called upon himself the censure of the American Medical Association. Now it appears that England has an intellectual counterpart of Apostle Macfadden in Capt. Anthony M. Ludovici. A lecturer and conversationalist,

one-time secretary to the late Sculptor Auguste Rodin, married, 43, Captain Ludovici is ostensibly an opponent of British Feminism, but his book dwells upon the physiological aspects of the argument with all the insistence and most of the exaggeration of a typical Macfadden editorial in breast-feeding, pride in body and "the happy congress of man and wife."—Time, Aug. 24, 1925.

ACUTE ARTERIO-MESENTERIC ILEUS*

E. M. McLAUGHLIN, M.D.

Winona, Minn.

Acute arterio-mesenteric ileus, as a post-operative complication, is characterized by symptoms of high obstruction, principally persistent vomiting. It occurs usually in individuals who have lost considerable weight, and have a ptosis of the abdominal viscera. This is one of the most important and constant etiological factors.

The condition is a true intestinal obstruction, and the obstruction occurs in the transverse portion of the duodenum at the point where it is crossed by the superior mesenteric artery.

The mechanics of the condition is as follows:

In visceroptosis, the small intestines and cecum lie at a lower level than normal, much of them being in the pelvic cavity. In the dorsal position, the weight of the bowel causes a pull on the mesentery and the main trunk of the superior mesenteric artery, the cecum pulling through the terminal ileum. This tension causes an obliteration of the angle which the artery makes with the vertebral column and aorta, thus compressing the transverse portion of the duodenum between the cord-like trunk of the artery and the aorta and thereby producing an obstruction. An acute dilatation of the stomach follows, which tends to aggravate the condition through pressure.

Dr. James McKenty† of Winnipeg has reported twenty-six cases in which he has found a chronic obstruction to the duodenum due to this cause. These patients presented various dyspeptic symptoms. He calls attention to the fact that, in the human abdomen, the antero-posterior diameter, at this point, is less than the transverse, while in all quadrupeds the antero-posterior diameter is greatest, thus giving a much wider angle between the artery and the aorta.

As a result of these conditions the quadruped duodenum is round where it crosses the vertebral column; while the human duodenum is normally flat at this point, due to compression by the mesentery. Thus there is a potential tendency to obstruction here, due to the upright position. This being

the case, a little more pull on the mesentery, due to ptosis and the dorsal position, is sufficient to result in the acute post-operative complication which I am attempting to describe.

The symptoms are those of a high intestinal obstruction. There is persistent vomiting of dark bilious material which keeps on in spite of repeated stomach washing. There is no great amount of abdominal distention, and enemas are successful in that plenty of flatus is passed; but the vomiting continues. The patient becomes dehydrated, the respiration shallow, and the pulse rapid and weak. The patient looks, and is, seriously ill.

The treatment is as simple as it is satisfactory. It consists in raising the foot of the bed and resting it on eighteen inch blocks, and turning the patient into the right lateral prone position, thus allowing the cecum and intestines to gravitate upward, and release the tension on the mesentery.

The results of this simple manner are so startling as to border on the marvelous. Within a short space of time the picture changes, the vomiting stops, and the patient is in comparative comfort.

We have recently had two cases of this post-operative complication.

Case 1. A married woman, aged 36, came to the hospital complaining of aching pain in the right lower quadrant of the abdomen, together with soreness and vomiting.

Her family history showed nothing bearing on the case.

She had borne three children. By starving herself to reduce her weight, she has recently lost 20 pounds.

Her physical examination was normal except for the abdomen, which was pendulous and flaccid—palpation disclosing a small tender mass in the right lower quadrant.

An appendectomy was done and a cigarette drain placed in a small abscess.

The postoperative course was marked by vomiting, which continued in spite of all efforts to relieve it.

On the second postoperative day the stomach was washed out, and potassium bromide was given per rectum.

On the third postoperative day the vomiting of dark brown bilious material continued all day. The stomach was washed out several times, but with only temporary relief.

On the fourth day the patient seemed to be failing. The vomiting continued all day, and gastric lavage was given every three hours day and night. Dehydration was combated by giving normal salt into a vein several times daily.

On the fifth day vomiting continued as before. The temperature became higher, and the pulse became faster. Lavage and intravenous salt solution was continued as before.

On the sixth day there was no change for the better, and the same treatment was continued until 4 P. M., when the foot of the bed was elevated on twelve-inch blocks, and the patient was turned into the right lateral prone position.

*Presented at the annual meeting of the Southern Minnesota Medical Association, Owatonna, Minn., May 18 1925.

† McKenty, James: Surg., Gynec. & Obst. April, 1924.

At 7 P. M. the stomach tube was passed. There was some dark fluid in the stomach, but not as much as before. The twelve-inch blocks under the foot of the bed were now replaced by eighteen-inch blocks. At 10 P. M. the stomach tube was passed and the stomach was found empty. From this time on improvement was rapid. There was no more vomiting, food was taken, and the patient made an uninterrupted recovery.

Case 2. A married woman, aged 26, who came to the hospital complaining of a dull aching pain in the region of the gallbladder, and a general rundown condition, with loss of twenty pounds in weight.

There has been no tuberculosis or other chronic disease in the family.

Her past history shows that she has borne no children. She had an appendectomy eight years ago; she has had several attacks of gallbladder colic, and she has had pyelitis for about two years, which was proved not tuberculous by cystoscopy and guinea-pig inoculation. The pyelitis has since cleared up.

A cholecystectomy was done.

The postoperative course was marked by persistent bilious vomiting, which continued for three days, in spite of all treatment, including repeated gastric lavage.

We then made a tentative diagnosis of arterio-mesenteric ileus. The foot of the bed was elevated with eighteen-inch blocks, and the patient was put into the right lateral prone position. The vomiting promptly stopped, and the patient made an uninterrupted recovery.

I cannot help thinking that this may be a more frequent cause of postoperative vomiting than is generally supposed.

Inasmuch as the postural treatment is so simple and effective in suitable cases, and, in any case, harmless and does not interfere with any other measures of relief, it seems to me it deserves to be tried in every case of persistent postoperative vomiting.

DISINFECTION OF HOUSES

It is generally recognized by the more progressive health authorities that house fumigation as heretofore practiced is of almost no value in the prevention of the spread of disease. Many pathogenic germs have only a brief existence outside the body, while even the more resistant varieties are not found on the walls, or ceilings, or hiding in the curtains of a sick room. They are found on articles that have come in contact with the patient. The tubercle bacillus is among the more resistant of the disease germs, partly because of the presence of a waxy substance in the cell wall and partly because in pulmonary tuberculosis it leaves the body inclosed in mucous matter which protects it from the action of sunlight and other germicidal agents. It is doubtful whether the usual fumigators will be of any value in destroying these germs. The only practical, reasonable and effective treatment for a house or room that has been occupied by a tuberculous patient, is a thorough cleansing with soap and water; mechanical removal of material likely to contain the germs is preferable to disinfection and fumigation.

(*Jour. A. M. A., Sept. 12, 1925, p. 845.*)

SKIN DIPHThERIA*

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Skin diphtheria is considered a rare affection. This may be due in part to the fact that its appearance is very seldom suggestive of diphtheria. Seldom is a diphtheritic membrane found in skin lesions even when diphtheria organisms are present. Naturally no diagnosis can be established without a culture. Investigators now advise having all slow healing wounds cultured, because the malady is prevalent and cure is comparatively easy if a diagnosis is established early.

REVIEW OF LITERATURE

Before the discovery of the causative organism, diphtheria of the skin was first recognized in Europe, by Chomel¹ in 1759, and by Bard in this country in 1771 during an epidemic in New York. In 1828 Trousseau² published an extensive description of the disease. In 1891 Neiser³ published in Europe the first proof that diphtheria bacilli may be found in the skin. O'Connor⁴ found diphtheria in an ulcer of the chin in 1897. Dawson¹ in 1910 recorded ten patients, of whom three were his own. Of these ten, four died because they were recognized too late. Levy² reviewing the literature up to 1917 found fewer than fifty proved cases recorded. He claims that the condition is much more common than these reports indicate, since its nature is often unrecognized. Most of these infections have been recognized in patients with throat diphtheria, which, of course, caused suspicion of possible skin diphtheria. However, since then many more records of wound diphtheria have been made in other people as well as in diphtheria patients.

Among the later reports we note that Weinert,⁵ in Germany, called attention to this malady in 1918 and during that year 200 cases were recorded in his own vicinity. Biberstein⁶ found twenty-three positive cultures in 131 slow healing wounds. Frankenthal⁷ reported thirty-three instances with two fatalities. Nieter⁸ found 286 positive cultures out of 497 patients where smears were taken from wounds. Hoffman⁹ saw 400 slow healing skin wounds in which the cultures showed the Klebs-Loeffler bacilli in sixty. Three of his patients died. Simons, Wearn, and Williams¹⁰ reported five in-

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stances of skin diphtheria with two deaths. Hart-sell¹¹ reported sixty patients without toxic symptoms or fatalities. Fitzgerald and Robertson,¹² investigating one of the military hospitals in Toronto, made a clinical diagnosis of skin diphtheria of one wound presented, in which diphtheria bacilli were found on culture. Stimulated by that, they took cultures from all wounds which did not readily heal. During that summer out of sixty-seven delayed healing wounds, thirty-two showed diphtheria bacilli. Adami,¹³ however, found only two in 306 wounds investigated.

These reports indicate that skin diphtheria would be found more often if cultures were taken from slow healing wounds.

REPORT OF CASES

M. D. P., an interne in a contagious ward, intubated a small boy for laryngeal diphtheria. A small laceration just proximal to the nail of the left index finger was noticed at the time. About a week later there was an infection in the finger where he had noticed the laceration during the intubation. This did not heal with ordinary treatment. The culture showed diphtheria bacilli. It did not form an open ulcer, and simply showed a slightly swollen dull red area with slight serous discharge next to the nail. Hypertonic salt solution was applied, x-ray treatments were given, and 5,000 units of antitoxin were given intramuscularly. The lesion healed in six weeks.

E. S., a girl four years of age, was brought in on August 25, 1923. She presented three small lesions, each less than 1 cm. in diameter, which had been present for three weeks and did not yield to ordinary care. One was present on the lateral side of the proximal phalanx of the middle finger of the right hand. Another was found just above the left knee. The third was present on the dorsum of the right foot, just above and lateral to the second toe. These lesions were ulcerated, but did not appear inflamed; a serous discharge was present. In only one did the edges appear reddened and ragged. A grayish white thin covering was present on the sore of the finger. All areas were cleaned with alcohol, tincture of iodine was applied and sterile dressings put on. On August 27, the wounds showed no improvement and no changes except that the lesion on the right foot was covered with a thick dirty gray membrane, and cultures showed diphtheria bacilli. Nose and throat cultures at the same time showed diphtheria. The ulcer above the right knee showed no diphtheria bacilli. All lesions cleared up in five to eight days. Treatment consisted in removing the necrotic tissue with a sterile applicator and applying 10 per cent silver nitrate once a day.

ETIOLOGY AND MODE OF INFECTION

The Klebs-Loeffler bacillus is the etiologic agent. Trousseau claimed that a break in the epidermis is necessary for infection. Adler (cited by Levy²) thought that a broken epidermis is not always nec-

essary. A guinea pig will develop skin diphtheria when the bacilli are applied to the unbroken skin. The bacilli enter the wound or the weakened skin area from:

1. The nose or throat of the same individual, autoinoculation. Various authors found that 1 to 3 per cent of healthy individuals are diphtheria carriers; hence such are always liable to wound diphtheria when a break occurs in the epidermis.
2. Another person (a diphtheria patient, a carrier, or someone in contact with a diphtheria patient).
3. Infected objects, especially such objects as were exposed to diphtheria bacilli.

PATHOLOGY

The wound may be present in any part of the body, in children or adults. It may have a dull grayish, whitish, or yellowish surface; it may appear necrotic. A distinct diphtheritic membrane may be found which will reappear in a few hours after removal. Removal of the membrane produces bleeding. The discharge of the wound is bloody serous, or it may be a brownish gray thick fluid. The neighboring glands are not usually involved. Trousseau, as cited by Levy,² describing skin diphtheria, says: "The wound first becomes painful and a colorless fetid serosity escapes, and a thick grayish flabby membrane appears on the surface. The edges of the wound are swollen and violent red in color. The disease does not usually extend, but remains stationary for months. When the epidermis alone is removed, the raw surface becomes covered with a white membrane, and a reddening like that of erysipelas soon develops around it. On the surface of the latter, the epidermis is elevated in many points by small masses of lactescent serosity. The vesicles thus formed run together and burst, the exposed epidermis being then covered with a white membrane. These new centers join to the main center and to each other, and so the disease spreads. The invasion generally takes place from the superposed parts toward the dependent parts, this probably being due to irritation of the serous secretion. . . . When the disease extends rapidly the fever may be very acute, but it is usually like the hectic fever accompanying supuration."

Adler (cited by Levy²) gives a clinical picture of an experimental case that is worthy of mention. He says: "There are surrounding areas of hard

infiltration, red like erysipelas. These are points of inflammation, which become confluent. The edges of these points are irregular, abrupt. They are yellowish or grayish white. Sometimes dirty, greenish necrotic areas are seen. If separation of the membrane is attempted, the base appears very red and bleeding. In the neighborhood of these there is marked edema. The surrounding lymph nodes are inflamed but not tender."

SYMPTOMS

Constitutional symptoms do not appear early in the disease as in cases of throat diphtheria,—perhaps because the skin does not absorb the toxin as readily as the mucous membranes do. But in extensive involvement or in smaller lesions that toxicity, prostration, vomiting, paralysis, cardiac have been neglected for some time, general symptoms do appear, such as: rapid pulse, fever, complication, and even death.

DIAGNOSIS

1. A culture is the chief aid in diagnosis. The patient may be a diphtheria carrier and harbor the bacteria in his nose or throat.
2. History of exposure to diphtheria.
3. A slow healing wound that appears rather stationary for some time.
4. A diphtheritic membrane may or may not be present.
5. A serous or bloody discharge may be present.

DIFFERENTIAL DIAGNOSIS

Skin diphtheria may be confused with impetigo contagiosa, especially if the lesion is small and the crust is not well formed. But impetigo is a lesion involving the superficial layers of the skin, as a rule, without conspicuous areola and without inflammatory base. Impetigenous lesions spread rapidly and become covered with dry yellowish flattened crusts. On removing these crusts we find a reddish, moist, abraded looking surface secreting a watery looking fluid and appearing like an area of abrasion or superficial burn. Unlike that, in skin diphtheria the lesion involves all the layers of the skin and on removal we get a raw looking area with bleeding. Impetigo spreads very rapidly if untreated. The absence of diphtheria organisms substantiates the diagnosis.

Blastomycosis should be ruled out. It usually presents a lesion consisting of an elevated irregular papillomatous area with a moderate sero-purulent secretion. The typical lesion presents an outer

zone of viliform processes, next a zone of minute abscesses, and the presence of the spheric capsulated budding organism; also the absence of the diphtheria organisms.

Syphilis of the skin, because of its variability in appearance, should not be confounded with diphtheria. There is no membrane and no tendency to the formation of confluent areas in syphilis. Syphilitic lesions are darker in color and more sluggishly inflammatory in appearance. In addition there are other eruptions and often a history of evidence of the initial lesion. The blood Wassermann and the absence of the Klebs-Loeffler bacilli in the culture will establish the diagnosis.

COMPLICATIONS AND SEQUELAE

Complications in skin diphtheria are rare but have been recorded. Usually complications come with extensive or prolonged involvement. Dawson¹ found four fatalities in his ten reported cases; these were all patients where a diagnosis was established late. Simon,¹⁰ Wearn, and Williams had two deaths out of five skin diphtheria patients. Hoffman⁹ had 6 per cent fatalities. Deutschlander,¹⁴ reviewing the older German literature, found only two cases. Anschutz¹⁵ found only two such cases in reviewing the later German literature. That compares favorably with the usual 7 per cent complications of throat diphtheria.

TREATMENT

1. Antitoxin is generally considered as the most important form of treatment, especially if any toxic symptoms are present.
2. Goppert¹⁷ suggests treatment by means of local application of active bacillus coli. He bases his treatment on the experimental work of V. Reische, who noticed that in broth bacillus coli cause a rapid disappearance of bacillus diphtheriae.
3. Biberstein⁶ found Eukupin of great value and reports success in treating twenty-three cases.
4. Frankenthal⁷ treated thirty-three cases with thirty-one cures. He used sunlight, ultraviolet rays, and acroflavin.
5. De la Riviere¹⁸ had a jet of superheated air playing on the tissues and he reports success in the average of three to five sittings.
6. Wendt¹⁹ and Wallgren report two cases, one of which had toxic symptoms. Both cleared up promptly with Dakin's solution.
7. Hartsell¹¹ found tincture of iodine (U.S.P.) applied daily the best form of treatment. His

method was to clean the wound with aseptic technic, using a 1 per cent soap solution, ether and alcohol; tincture of iodine was then applied, and this was done every day.

The author found in the case of E. S., reported above, that the lesion on the finger healed promptly when the necrotic tissue was removed by means of cotton on an applicator and then applied 10 per cent silver nitrate, while the other two lesions, which were cleaned and treated with tincture of iodine once a day, showed no improvement. These two lesions, however, healed promptly by treatment with 10 per cent silver nitrate after the necrotic tissue was removed.

CONCLUSION

1. Skin diphtheria is not so rare as is commonly supposed.

2. Cultures should be taken from all slow healing wounds. Repeat cultures if necessary.

9. Cure is easy in skin diphtheria if a diagnosis is established early.

Note.—I wish to express my gratitude to Dr. Max Seham for his help and advice.

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THE DEPRESSOR SUBSTANCE IN HEPATIC TISSUE

Attempts to lower the blood pressure through the administration of liver extracts have been reported. Obviously, the use of crude tissue extracts, however potent they may be, is attended with great danger. Protein effects, including a variety of anaphylactic manifestations, are always threatening; furthermore, the tissues yield a diversity of potent products that should not be injected indiscriminately. It is gratifying to learn, therefore, that experiments indicate the constituent of the liver extract which affects blood pressure to be non-protein in character. According to the latest reports, the principle depresses the arterial tension and maintains it at subnormal levels for a long time. One cannot avoid the belief that progress in the possible control of clinical hypertension is imminent.

(*Jour. A. M. A.*, Sept. 5, 1925, p. 750.)

THE MOORE PYORRHEA REMEDY FRAUD

The Government has debarred from the use of the mails the Moreham Company, Fred Hamilton, Moore's Medicine Laboratories, Inc., and Moore's Laboratories, all of Kansas City, Mo. These various concerns have for some time been exploiting, largely on the mail order plan, an alleged cure for pyorrhea. The alleged remedy was found to consist essentially of emulsified coal-tar cresol with a little pyridine or coal-tar base, was emulsified with resin soap. The government presented evidence to show that the medicine would not heal a case of pyorrhea and would not cause "receding, inflamed and bleeding gums" to become "firm and pink," it would not "tighten loose teeth" nor would it "conquer pyorrhea" by causing the germs to "just clump right up and quit the job," as claimed.

(*Jour. A. M. A.*, Sept. 26, 1925, p. 994.)

ACUTE PANCREATITIS*

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ANATOMY

The pancreas is a compound racemose gland analogous in its structure to the salivary glands, though less dense. It is situated transversely across the upper abdomen at the level of the second lumbar vertebra and posterior to the stomach reaching from the concavity of the duodenum to the spleen. It varies from five to six inches in length in the adult; its breadth is about an inch and a half and its thickness about one inch, being considerably greater at its right extremity. Its weight varies from two to three and one-half ounces (60 to 100 grams). It faces into the lesser peritoneal sac, its posterior surface being devoid of peritoneum and in contact with the aorta, the splenic vein, the left kidney and its vessels, the left supra-renal gland, and the origin of the superior mesenteric artery. The pancreatic duct (Wirsung) passes through the entire length of the organ from left to right, receiving the various small ducts of the lobules composing the gland. Near the duodenum this duct is about the size of a small quill. In the neck of the pancreas the duct passes very obliquely downward, back and to the right and comes in contact with the common bile duct. Leaving the head of the pancreas it passes very obliquely through the mucous and muscular coats of the duodenum and usually terminates by an orifice common to it and the common bile duct upon the summit of an elevated papilla, situated at the inner side of the descending portion of the duodenum, three or four inches below the pylorus. A slight dilatation in the duct just before it opens into the duodenum is known as the ampulla of Vater, which is of no little consideration from the surgical standpoint. Sometimes the pancreatic and common bile ducts open separately into the duodenum. Frequently there is an accessory duct, duct of Santorini, given off the pancreatic duct at the neck of the organ and which opens into the duodenum about an inch above the orifice of the main duct. The blood supply to the pancreas is from the splenic, hepatic and superior mesenteric arteries and the venous drainage is all into the portal system. The very abundant arterial supply protects the pancreas against gangrene from

occlusion, the necrosis in acute pancreatitis being independent of circulatory disturbances. The intimate connection of the pancreas to the great solar plexus, through the celiac, superior mesenteric and splenic plexes, may explain the agonizing pain, the collapse and frequently associated intestinal paralysis in acute pancreatic disease. The lymphatic connections of the pancreas are to the liver, gallbladder, duodenum and pylorus.

As late as the year 1600, the pancreas was still considered as nature's cushion for the support of the stomach. Wirsung discovered the duct known by his name in 1642, but the purpose of the pancreatic juice was not definitely known until about the middle of the eighteenth century. Pancreatic disorders have been treated surgically for only about thirty years. In 1879 appeared the first article on fat necrosis, which was at that time thought to be a definite entity, its cause being considered idiopathic. Fitz seems to have been the first man who connected up fat necrosis with pancreatic disease. He expressed the conviction that fat necrosis was always secondary to disease of the pancreas.

PATHOLOGY

Three varieties of acute pancreatitis have been recognized by Fitz: the hemorrhagic, gangrenous and suppurative.

In *hemorrhagic pancreatitis* the gland is large and infiltrated with blood, the color of which varies with the duration of hemorrhage and severity of inflammation. Yet necrosis may show on section due to autodigestion. Extensive hemorrhage may be found also in the mesentery and in the retroperitoneal space. It may also appear about one of the kidneys, especially the left.

Gangrenous pancreatitis follows hemorrhagic pancreatitis, but no distinct line of demarcation can be established. The whole gland or any part may become gray and soft and wholly or partly slough from its attachments. The lesser sac may become filled with this material mixed with dark offensive fluid in which masses of necrotic material may be found. This is known as a pseudo-cyst of the pancreas. Occasionally there is a rupture into the stomach or bowel with discharge of the exudate into that viscus.

In *suppurative pancreatitis* a single abscess or multiple abscesses may form and there may be diffuse purulent infiltration of the surrounding tissues. Fat necrosis is rare in this condition. Septic thrombi of the portal vein may follow with

*Read before the Minneapolis Surgical Society, Minneapolis, April 2, 1925.

multiple small abscesses in the liver. The pleura and the pericardium may become infected by the extension of the inflammatory process through the diaphragm. Various bacteria, especially the colon bacillus, are found in the affected tissues.

Fat necrosis or fat digestion is a striking feature of the hemorrhagic and necrotic type of pancreatitis. The condition is rarely found except in affections of this organ. It has been produced experimentally by inserting pieces of pancreas under the skin or into the sub-peritoneal fat and by experiments on the pancreas itself.

ETIOLOGY

There are two main theories concerning the cause of acute pancreatitis.

1. *The infectious theory:* John P. Deaver is the most prominent advocate of this theory. He, with Pfeiffer, has found that infection may spread by way of the lymphatics from a gastric or a duodenal ulcer, from an infected gallbladder or appendix, and has shown experimentally that it is possible. On this point Deaver himself states: "The retrojection of normal bile is, to my mind, practically never the cause of acute pancreatic disease, and only rarely does the retrojection of infected bile damage the pancreas sufficiently to cause chronic pancreatitis. The direct connection between the lymphatics of the liver, the gallbladder, the pylorus, the duodenum and even the appendix to the peri-pancreatic lymphatics was demonstrated by Dr. Pfeiffer and myself some years ago."

Deaver states that infection may enter the gland through four portals: by the blood stream; by ascending infection from the duct, from the biliary tract or duodenum; by the lymphatics; by contiguity from adjacent viscera. "The damming back of active pancreatic secretion within the interstitial substance of the gland is likely to result in hemorrhagic pancreatitis. About 50 per cent of all cases of pancreatitis are associated with disease of the gallbladder or common duct. In the majority of instances the infecting agent is carried by the lymphatics tributary to the pancreas." (Deaver.)

"A gallstone at the mouth of the common bile duct may cause the bile to back up into the pancreatic duct and acute pancreatitis is almost inevitable when infected bile thus reaches the pancreas. The pancreas tissue suffers from the infection, which opens the way to secondary autodigestion of the tissues from the pancreatic juice with resulting fat necrosis." (Deaver.)

2. The second theory of the pathogenesis of acute pancreatitis is that it is due to the entrance of bile or duodenal content into the pancreatic duct and that the symptoms are due to infection and to activation of the trypsin of the pancreatic juice.

Among the men who differ from Deaver and Pfeiffer on their theory of infection via the lymphatic route are Truhart of Germany, Archibald and Gibbon.

Truhart states that the pancreas of a man is not susceptible to bacterial invasion and that the excretory duct rarely allows bacteria to enter. Archibald and Gibbon believe Deaver's theory lacks experimental proof and depends purely upon clinical inferences. Hildebrandt produces fat necrosis in animals by ligating the secretory duct and by lacerations of the pancreas. Flexner has demonstrated fat-splitting ferments in the necrotic areas and also that sterile pancreatic juice may produce fat necrosis. He further claims that bacteria have been but rarely found in the necrotic foci. He states that trypsin is the direct cause of fat necrosis because it can always be found in those areas and it is never found in normal fat. It has been proven that olive oil injected into the duct of Wirsung will sometimes produce necrosis of the pancreas and fat necrosis in the surrounding fat. This has been explained to be the result of the pancreatic juice splitting up the fat and producing a soap. This soluble soap permeates the pancreas, destroying it. These experiments were most successful at times when the stomach was full of food. Dr. Carl Eggers thinks that similar conditions may play a rôle in the human body because at the height of digestion the duodenum contains much fatty material and some of its contents may pass through the papilla and enter the duct of Wirsung. This, he explains, could be more possible if there were a dilatation of the papilla caused by the previous passage of a gallstone. (At this point it might be stated that acute pancreatitis frequently follows the ingestion of a heavy meal.) Even if the papilla were not dilated by the passage of a gallstone it would not be difficult to imagine that relaxation of the sphincter might occur, allowing duodenal contents to enter the duct. We know that other sphincters, as, for instance, the pylorus and the sphincters of the ureters, under certain conditions allow regurgitation and it is agreed that catarrhal jaundice is the result of inflammation extending up the common bile duct from the duodenum. It has

been further demonstrated that bile injected into the duct of Wirsung will produce necrosis of the pancreas, brought about probably by the activation of the fat-splitting ferment trypsin by the bile. It was proven by Dr. Eugene Opie in 1904 that this method of development is possible, due to a gallstone obstructing the papilla. Archibald and Gibbon state that three conditions must be present to make possible the passage of bile into the duct of Wirsung. There must be: (1) a change in the composition of the bile, increasing the proportion of bile salts; (2) undue resistance, perhaps amounting to a spasm of the common duct sphincter; (3) an abnormal rise of bile pressure in the biliary system, either in the gallbladder or in the common duct. There are others who contradict the possibility of acute pancreatitis being the result of bile entering the duct of Wirsung.

Recent research suggests that the necrosis is the result of autolysis from activation of the pancreatic secretion by bacterial action, the bacteria penetrating into the pancreas in infected bile or intestinal juice. The resulting autolysis entails necrosis and the toxic substances then penetrating deep into the surrounding tissues induce the severe general symptoms as they are absorbed. Exceptionally, the activation may be the work of bacteria by way of the blood or lymph, or there may be embolism or thrombosis. But under all circumstances the direct causal agent is the activated trypsin, its action on the parenchyma causing the typical acute necrosis. It is evident, therefore, from the various views expressed above, that no one thing is admitted, by the various men who have studied the subject, to be the sole and direct cause of acute pancreatitis. Dr. Eggers believes after a careful survey of the experimental data and after a review of his own cases:

(1) Infection by means of the lymphatic extension plays no rôle in the production of acute pancreatitis.

(2) That regurgitation of duodenal contents may play a rôle. He states that theoretically regurgitation is possible and that in three of his six cases the onset of symptoms occurred at the height of digestion.

(3) That the gallbladder and bile probably are in some way connected with the development of acute pancreatitis. In five of his six cases gallstones were found, and in the sixth a disease-thickened gallbladder. He states that he is unable to

say whether bile actually entered the pancreatic duct, or whether a gallstone or a spasm of the sphincter temporarily obstructed it and caused increased pressure, with subsequent rupture of the pancreatic duct.

SYMPTOMS

A sudden acute abdominal seizure, overwhelming pain, in an apparently healthy, usually obese individual, accompanied by incessant vomiting, upper abdominal distention, a transverse resistance not easily elicited, weak pulse, abnormal temperature, collapse and sometimes cyanosis, should suggest acute pancreatitis. The previous history will usually show attacks of severe epigastric pains which have been regarded as gallstone colic and have been treated as such. "Not infrequently the first attack of this kind occurs during or soon after pregnancy." (Deaver.)

In the course of a few hours there is usually some swelling of the epigastrium. Some jaundice may appear owing to obstruction of the common bile duct by a gallstone in the diverticulum of Vater or by swelling of the duodenal mucosa, etc. Nausea and vomiting are early symptoms, increasing in severity, but without relief. The temperature may be normal or abnormal in case of hemorrhage without inflammation and may be slightly elevated in the inflammatory cases, in which the fever may be preceded by chills. The bowels are usually constipated. Should the patient's life be prolonged, peritonitis appears, the pain and tenderness continuing and the abdominal muscles becoming rigid. Marked distention of the abdomen, constipation, a rising temperature, a rapid and thready pulse, intense thirst, delirium, coma, then occur in rapid succession, ending in death.

If an abscess occurs in the pancreas it may rupture in the stomach or bowel with the result that blood, pus and pancreatic detritus appear in vomitus or stools.

Pain is by far the most important and persistent symptom. It is sudden, severe and overwhelming. Its character is colicky and located in the epigastrium, usually slightly to the left of the median line. Sometimes pressure will relieve it to some extent, but most frequently morphine has to be resorted to.

Vomiting is the next important symptom. It is persistent, lasting until operation, or death. The vomitus contains bile, food and mucus.

Collapse symptoms soon appear and sometimes

the patient is cyanosed. The physical signs depend on the stage during which the patient is seen. Most patients are seen early and during this period the signs point to some acute lesion in the upper abdomen. There is usually no distention and slight rigidity during the first day or two. The most marked sign is extreme tenderness above and slightly to the left of the umbilicus.

DIAGNOSIS

Within the last years there has been a great increase in the number of reported cases of acute pancreatitis, which proves that the symptom complex is becoming more familiar to the medical profession. But a preoperative diagnosis of acute pancreatitis is more rarely made than any other abdominal condition. There is no one definite pathognomonic sign or symptom and furthermore it is nearly always seen in individuals who have had severe abdominal disorders and frequently the extremely desperate condition of the patient necessitates surgical intervention before a definite diagnosis can be made. Diagnosis is possible if the patient is seen within the first forty-eight hours. The onset is sudden, characterized by excruciating pain, persistent vomiting and signs of collapse. Neither the abdominal distention nor the rigidity is so pronounced as in other acute abdominal conditions. Deaver states that he is of the opinion that many of the conditions diagnosed as acute indigestion, angina, etc., where the patient gives the history of having eaten excessively, is stricken with sharp, acute epigastric pains, followed by depression which lasts only for a short time and recovers in a few days, are instances of mild, acute pancreatitis. The pathology in these cases is a very slight punctate hemorrhage into the pancreas.

The history is important because most cases of acute pancreatitis will give a history of having previously had gallstones or appendicitis or duodenal ulcer. Bearing in mind the difference between the intensity of the symptoms and the slight distention of the abdomen, one should at least think of acute pancreatitis, especially when the patient is apparently healthy and the attack has come on soon after eating a heavy meal. There is usually a leucocytosis with a relative increase in polymorphonuclear cells. The urine may show a small amount of sugar. Blood sugar may or may not be increased.

DIFFERENTIAL DIAGNOSIS

(1) A perforating ulcer of the stomach may be

suspected, but can generally be excluded by a previous history of pain after food, hemorrhages, and the more general peritonitis that usually follows. (2) Perforating ulcer of the duodenum may present much difficulty, as in those cases one has not the history of pain on food ingestion and no history of hemorrhages. Moreover, the pain may be as severe and even collapse may be present. In addition, the two conditions are found most frequently in males over forty years of age. (3) Perforation of an infected gallbladder may also simulate acute pancreatitis. When it is possible to get a blood chemistry made, a hyperglycemia is frequently found, especially if the tail of the pancreas is involved. The urine may contain albumin, casts, sugar and lipase. (4) An irritant poisoning may simulate acute pancreatitis, but can usually be excluded by the history and by the character of the vomitus. (5) Intestinal obstruction is the condition most frequently suspected. Early collapse is not usually present in intestinal obstruction. The vomiting does not appear so early in the course of the trouble. Fecal vomiting seldom occurs in pancreatitis. The pain is not so sudden, severe and overwhelming. A hyperglycemia or glycosuria is never present in intestinal obstruction except in diabetics. (6) Stone in the common duct may closely simulate acute pancreatitis. It may be excluded by absence of collapse, a history of previous attacks and pain referred to the right shoulder region.

Bartlett states that there is no pathognomonic sign or symptom, but the condition of acute pancreatitis should always be thought of in all acute upper abdominal conditions in which the symptomatology is not definitely that of any of the ordinary disorders. The preoperative diagnosis in one of the author's cases of acute pancreatitis which he reports in this paper was perforating ulcer of the duodenum, and in another was stone in the common duct, and in another, empyema of the gallbladder.

PROGNOSIS

The prognosis depends upon the amount of damage done, the intensity of the process and the stage at which the operation is performed.

TREATMENT

In those instances where there is a tumor-like prominence, as a result of the process, the incision is usually placed directly over it. This will usually be in the median line or slightly to the

left. Having opened the abdomen, the further steps of the operation will largely depend upon the investigation of the pancreas. The routes by which the pancreas is most easily approached are: (1) through the gastro-hepatic ligament; (2) through the gastro-colic omentum, or (3) through the transverse meso-colon. The head of the pancreas can perhaps best be reached via the gastro-hepatic ligament and the body and tail best via the gastro-colic omentum.

On first opening the peritoneal cavity it may be concluded that acute pancreatitis is present if hemorrhagic fluid escapes, and if the omentum present in the wound shows areas of fat necrosis. At this stage it is well to examine the whole of the upper abdomen, *e.g.*, gallbladder, duodenum and stomach, for coexisting pathological conditions. As stated above, cholelithiasis is present in more than half of the cases of acute pancreatitis. The pancreas is usually enlarged, tense and discolored. It may be soft in the necrotic type. Having exposed the pancreas through the gastro-colic omentum or by another route, the next step is to relieve the tension within the pancreas by opening into its substance by limited incisions or knife point punctures. This, however, should be done after the viscera are well packed off. This relieves the blood and fluid within the pancreas, affording relief and reducing the tension and furnishing free drainage, which constitutes the chief surgical indications.

Drainage may be accomplished by a composite rubber and gauze drain emerging through the median abdominal incision. It is well to bring the drain to the surface in a conduit of rubber, thus protecting the drain-tract from the digestive properties of the pancreatic fluid. It sometimes happens that the incisions for drainage made in the pancreas will bleed considerably. It may therefore be necessary at times to suture or pack them.

The gallbladder, if found to contain stones and if the patient's condition warrants it, should be removed. Drainage is usually not necessary, but if it is thought wise the drain should be brought through a small separate wound to the right of the first incision. It must also be seen that a blockage by a calculus of the common duct opening into the duodenum is not present. While it is generally impossible to stop to remove the calculus in the usually desperate circumstances of these operations, the performance of a cholecystostomy will allow an outward drainage of bile, and the stone

which blocks the ampulla can be removed when the patient's condition is better. Posterior drainage through an incision placed in the left costo-vertebral angle is considered by some surgeons a necessary part of the operation. This is especially true if the tail of the pancreas is the part principally involved. The head of the pancreas is, however, the part most frequently involved and because of its position, anterior to the vertebral column, posterior drainage is not so readily effected.

Adhesions are often found in these cases, and may have to be separated by blunt dissection, before it is possible to expose the pancreas in the wound. Operation should be performed immediately upon the discovery of the condition or suspicion of the condition, before fat necrosis becomes extended and secondary peritonitis occurs.

CASE REPORTS

Case 1. Mrs. F. W., aged 52, mother of three children, gave history of having severe attacks of pain in the upper abdomen over a period of ten years. The condition had been diagnosed as gallstones after the x-ray picture showed the presence of a shadow in the gallbladder region. She refused operation. Six months after last gallstone attack she was seized with pains more severe than she had experienced in her previous attacks. The pain did not come as suddenly, but was similar in character and was more persistent. It was not relieved on pressure. Vomiting was more continuous than in previous attacks. She was taken to the hospital and operated upon at once. The pre-operative diagnosis was stone passing through the ducts.

Her temperature at the time of operation was 100, pulse 100, respirations 26, urine negative for sugar and albumin. Blood sugar .095, leucocyte count 12,000, 75 per cent p.m.n. A general anesthetic was given and a right upper rectus incision made. On opening the abdomen the gallbladder was found filled with stones. A few small grayish areas of fat-necrosis were present in the omental fat, no stones palpable in the common duct. On palpation, the pancreas was found enlarged and tense. The pancreas was exposed through the gastro-colic omentum and it was found to be dark in color. Fat-necrosis was present throughout the lesser peritoneal cavity. The pancreas was opened by a blunt instrument and a cigarette drain sutured in the substance of the gland.

Nothing was done for the gallstones, as the patient's condition was not good. The wound was closed with plain and chromic catgut and silkworm gut.

The recovery was quite uneventful with the exception of vomiting, which persisted for two weeks. Pain was severe for the first week. Drain was removed on the fourteenth day. Wound entirely closed on the twenty-fifth day. The patient reported several times a year for two years and up to that time had had no attacks of gallstone colic.

Case 2. W. S., male, aged 39, married, entered the Minneapolis General Hospital Dec. 22, 1922, and gave the following history: thirteen days before, the patient returned from work complaining of nausea and slight pains in the

upper abdomen. He was given something hot to drink and thereupon he started to vomit. The vomiting was persistent all the following night. The pain in abdomen became more severe and a physician was called who gave a hypodermic and prescribed liquid diet to be started after twenty-four hours. A second physician was called that second day who made a diagnosis of kidney trouble and sent him to Jordan for mud baths. The patient remained there eight days, during which time the symptoms became more severe. He was brought back to Minneapolis and the second physician made a new diagnosis of pancreatitis and suggested operation, which was refused. A third physician was called and he diagnosed the condition as a malignant tumor of the liver, causing intestinal obstruction. At this time there was a palpable mass slightly to the right of the median line. The patient then consented to go to the General Hospital (13 days after the onset). The patient's symptoms on entering the hospital were severe, colicky, griping pain in the mid-abdomen, slightly to the right of the median line and radiating to the left shoulder and lumbar region. A distention of the abdomen was present and had been coming on for a week previously. The vomiting, which had improved to some extent, now became worse—the vomitus contained mucus, bile and streaks of blood. During the time the patient was at Jordan he became deeply jaundiced, but this had cleared up by the time he entered the hospital. The tenderness over the abdomen, which was slight at first, now became extreme over the entire abdomen. He gave no history of a previous, similar attack. The stools, which he had only after enemata, were clay-colored. Blood pressure was 180/125, temperature was 99 and pulse 130. The urine contained albumin and a trace of sugar. The leucocyte count was 18,000. The physical examination showed a well-developed man, weighing about 175 pounds. Skin negative, pupils equal, regular and reacted normally to light and accommodation. Ears, nose and throat negative. Chest negative, heart normal in size but rapid (130 per minute), tones regular, no murmurs. The abdomen was distended considerably, a distinct mass was palpable over the gallbladder region about four by five inches. Dullness was present over this area, but the rest of the abdomen was very tympanic. Abdominal wall was rigid, especially on the right side, and peritoneal irritation sign was present generally. The extremities were negative, reflexes negative.

The pre-operative diagnosis was empyema of the gallbladder with probable rupture. I operated him the night of his arrival, using local anesthesia. The omentum which presented was studded with small, white fat-necrosis areas. Considerable sero-sanguinous fluid was present in the abdominal cavity. A large mass, indefinite in character, was found in upper abdomen. In passing a blunt instrument into it a large amount of sero-sanguinous fluid escaped (about 16 ounces). This reduced the size of the mass slightly. Three cigarette drains were inserted deep in the opening and the wound was closed with chromic catgut and silkworm gut. Gas anesthesia was employed only during the deeper exploration of the abdomen. The pulse reached 160 on the morning of the following day and in the evening became uncountable. Respiration became gasping and patient died at 10 p. m., twenty-four hours after the operation.

An autopsy was limited to examination through the surgical wound. The outer portion of the mass was adherent to the omentum, transverse colon, pyloric portion of the stomach and duodenum. In the base was found a partly necrotic pancreas. Liver and gallbladder were normal. No stones were found in the gallbladder.

The real condition present here was an acute gangrenous pancreatitis with formation of a pseudo-cyst in the lesser peritoneal cavity.

Case 3. D. W., male, aged 54, entered the Minneapolis General Hospital October 7, 1923, giving the following history: The evening before he had felt sick to his stomach, but ate a light supper and went to bed. At 5:30 in the morning he was seized with a severe cramp-like pain in the upper abdomen and vomited. A physician was called and he was sent into the hospital. He stated that seven or eight years ago he had an attack that was somewhat like this one and since that time he had had several slight attacks, but did not stop work. Temperature was normal and pulse normal on entering the hospital. A heavy trace of albumin was present in the urine. The leucocyte count was 22,400, 88 per cent p.m.n. Blood pressure 124/80. Vomiting was almost continuous on his arrival. The vomitus contained no blood. The abdomen was not distended, but very tender over the upper left quadrant. No tenderness to the right of the median line. Pain was severe in the epigastrium and in the lumbar region. Bowels were constipated. A diagnosis of acute pancreatitis was made and he was operated at once.

On first inspection of the abdominal cavity no pathology was apparent. Gallbladder was found normal. No evidence of pyloric ulcer. Appendix normal. No fat-necrosis present in general peritoneal cavity. No fluid present in general abdominal cavity.

On palpation of the head of the pancreas with one finger through the foramen of Winslow, it was found larger and softer than normal. The gastro-colic omentum was opened and areas of fat-necrosis found all about the pancreas. The pancreas itself was dark red in color. Two openings were made into the substance of the gland and the ends of two cigarette drains anchored there. The abdominal wall was closed with plain, chromic and silkworm gut.

The temperature went up to 100 and 101 during the first post-operative week, but reached normal on the eighth day. The pulse during that period varied between 90 and 105. The drainage was profuse during the first week, after which time it slackened and disappeared entirely on the tenth day. The drains were then removed. The catgut sutures were digested during the first four days and it was necessary to add more silkworm sutures, which was done in bed under novocain. Vomiting continued for four days after operation, but he complained of very little pain. Recovery was complete and the patient was up on the twentieth post-operative day.

Case 4. I. U., male, aged 68, entered the Minneapolis General Hospital December 29, 1924. Two days before he had begun to have indefinite pain in the epigastrium. Pain was constant and did not radiate. One day ago he began vomiting without relief. Today the pain became worse and seemed to be most severe in the lumbar region and left chest posteriorly. Bowels had not moved for two days. He had no chills, temperature 100 and pulse 90 on

admission. He had had no similar attacks before. The abdomen was slightly distended and generally tender. Tenderness was especially acute over the epigastrium and left hypochondrium. Peritoneal irritation sign was present over entire upper abdomen. Slight rigidity of recti was present, but no palpable masses. Vomitus did not contain blood, urine negative, leucocyte count 18,400, p.m.n. 68 per cent, blood pressure 150/110. The patient gave the appearance of being acutely ill and an emergency operation was decided upon. The pre-operative diagnosis was perforating ulcer of duodenum. Abdomen opened by high right rectus incision. A small amount of bloody fluid escaped. The omentum was covered with numerous small white spots. On inserting a finger into the foramen of Winslow a large amount of sero-sanguinous fluid appeared. The gallbladder was thickened and filled with stones. On palpation the pancreas was found very much enlarged and tense. The approach to the pancreas was made through the lesser omentum. On inspection it was found to be very dark in color with considerable fat-necrosis in the immediate vicinity. The lesser peritoneal cavity was exposed and incision made into the capsule of the pancreas. The pancreatic tissue was opened by inserting a Kelley forceps. A large cigarette drain was sutured in the pancreas and brought out through the lesser omental opening.

As the patient's condition was fair at this time the gallbladder was opened and the stones removed. A large tube drain was put into the gallbladder and another cigarette drain placed down at the foramen of Winslow. The abdomen was closed with plain and chromic catgut and several silk worm gut sutures. The operation was done under gas-oxygen anesthesia. The pulse increased to 120 on the morning of the following day, but both temperature and pulse were normal twenty-four hours after the operation. Vomiting stopped and he said he felt better. On the second post-operative day his temperature reached 102.5 and he started coughing and expectorating bloody sputum. His pulse went up to 160 in the evening of that day. He became cyanosed, respiration became gasping and he died fifty-two hours after operation. It was my opinion and that of a consultant that a coexisting pneumonic condition, brought about possibly by the anesthetic, contributed to his death.

Case 5. E. L. The case is that of a colored woman, forty-one years of age, who was admitted to the General Hospital August 18, 1924. She had had nine miscarriages at two or four months; two children; married four times. Late in the morning of the day of admission the patient was seized with a sharp pain in the epigastrium which radiated to her back, between the shoulder blades and down the spine. The attacks came on at intervals of five to ten minutes. She had had numerous similar attacks in the past three years. She had had five attacks during the past month. With these attacks she had definite chills and fever. Following an attack she had noticed clay-colored stool on numerous occasions.

On admission she had a leucocyte count of 13,000, with 61 per cent p.m.n. August 19, the urine was amber, acid, 1,021, albumin plus, sugar negative, occasional red blood cells and a few pus cells. occasional hyaline casts; trace of bile. August 20, she developed physical signs of pneumonia. August 22, and again August 28, the urine showed

the presence of sugar. No acetone or diacetic acid. August 22, 10,900 leucocytes; the Wassermann was positive; bile pigment in blood plasma negative. On the 25th her abdominal tenderness practically disappeared. On the 31st she became drowsy and the following day went into coma and died. The blood sugar was .789 per cent on September 1.

Diagnoses: tabes with crisis; abdominal angina; cholecystitis.

Autopsy findings: The subcutaneous fat is 5 cm. in thickness. The peritoneum and omentum are studded with flat cheesy areas about 5 to 10 mm. in diameter. The appendix is small and retrocecal. The diaphragm is at the third intercostal space on the right and the fourth rib on the left.

No adhesions or fluid in the pleural cavities. The pericardial cavity contains about 10 c.c. of clear fluid. The left lung weighs 420 grams, the right 480 grams. Crepitation is reduced in the lower lobes and on section there is an increased amount of fluid and blood, no pus.

The liver weighs 1,575 grams. The capsule is smooth. The organ is soft. The cut surface is pale yellow. The cut edge everts. The gallbladder contains about ten calculi of different sizes. There is a small calculus about 5 mm. in diameter in the common bile duct about 2 cm. from the ampulla of Vater, which partially occludes the passage. The biliary ducts are dilated slightly. The gastro-intestinal tract is negative except that there is a small diverticulum about 1.5 meters from the ileocecal valve. The head of the pancreas is grayish and soft. The body and tail are grayish red and extremely soft in consistence. On section the lobular markings stand out. There is a small area of necrosis in the center of the body which shows greenish discoloration. At the tail of the pancreas is a large, ill-defined cavity, surrounded by the spleen and the hepatic flexure of the colon and containing a foul-smelling grayish liquid with flakes of whitish soft material. A similar cavity is found at the head of the pancreas behind the duodenum and pylorus which also contains fluid of similar character.

Diagnoses:

1. Gangrenous pancreatitis with cyst formation.
2. Fat necrosis of omentum and peritoneum.
3. Cholelithiasis.
4. Cloudy swelling of liver, kidneys and heart.
5. Edema and congestion of lungs.
6. Fatty degeneration of liver.

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SPLENECTOMY FOR HEMOLYTIC JAUNDICE: WITH REPORT OF CASE*

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The following case of hemolytic jaundice in an infant, with apparently complete cure following splenectomy, is of sufficient interest to warrant reporting on account of the early age at which symptoms appeared. As far as I am able to determine, this patient is the youngest child, reported in the literature, that has been subjected to splenectomy for hemolytic jaundice.

For the opportunity to submit this report and the complete data of the clinical observations during the hospitalization of the patient prior and subsequent to the splenectomy, I am indebted to Dr. E. D. Anderson of the Staff of the Minneapolis General Hospital. Dr. Anderson made these observations, the diagnosis, and referred the case to my service, recommending surgical treatment.

The patient was a female child, born July 2, 1922, at full term, normal delivery. The weight at birth was 8.5 pounds and the infant appeared to be in normal health for the first two weeks of its life. At this time the mother noticed the beginning of jaundice, and the following week, or about the twenty-first day following birth, Dr. Anderson first observed the patient. Examination of the blood at that time showed the hemoglobin to be 18 per cent. By means of a series of thirteen sinus and intra-peritoneal transfusions he was able to bring the hemoglobin up to 70 per cent and the r.b.c. count was 4,000,000.

The patient was admitted to the General Hospital December 11, 1922, at which time the hemoglobin was estimated at 28 per cent, r.b.c. 2,000,000, w.b.c. 31,000. A series of blood transfusions (four intra-peritoneal) were given and on January 27, 1923, the patient left the hospital with a hemoglobin report of 66 per cent, r.b.c. 4,000,000, w.b.c. 13,500, the diagnosis being splenic anemia.

The clinical notes at this time, summarized, showed that when her blood count went down to 2,000,000 her blood smears showed bone marrow stimulation, e.g., much polychromatophilia and many microcytes. As the red cells increased to 4,000,000 the bone marrow stimulation disappeared and the blood smear showed a picture of normal adult blood. When the red count was low, the white count was high, and if the red count approached normal the white count also showed the same tendency. The feces were negative to occult blood.

The child did not do well at home and was readmitted to the General Hospital February 22, 1923. Hemoglobin at this time was 21 per cent, r.b.c. 1,380,000 and w.b.c. 26,000. Large mononuclear leucocytes predominated. After seven intraperitoneal blood transfusions the blood showed

hemoglobin 66 per cent, r.b.c. 4,000,000. The urine showed occult blood following the transfusions. The feces remained negative. The patient again left the hospital April 25, 1923, improved, but did not do well and was readmitted for the third time August 10, 1923. She was anemic, jaundiced and listless. The sclera and skin showed quite a marked icterus. The child was irritable, refused feedings and appeared to be in pain when the abdomen was palpated. The spleen at this time was enlarged to a considerable extent, being palpated as low as the crest of the ilium. The hemoglobin now showed 22.4 per cent, r.b.c. 2,000,000, w.b.c. 19,000. Four intraperitoneal, and two jugular blood transfusions, were followed by a rise of the hemoglobin to 66 per cent, r.b.c. to 4,000,000, w.b.c. 16,000. On September 29, 1923, patient unfortunately developed varicella and during isolation the blood count was reduced to 47 per cent, r.b.c. 2,500,000, which, following three jugular and one intra-peritoneal blood transfusions, rose to 70 per cent, 4,000,000 and 11,000 respectively.

The laboratory reports on fragility and urobilinogen tests were as follows:

Fragility test while under the care of Dr. Anderson was found to be normal on two occasions.

FRAGILITY TESTS

12-28-22. Fragility test normal, r.b.c. 4,000,000, w.b.c. 13,000.

8-22-23. R.b.c. 2,800,000, w.b.c. 16,000. Numerous nucleated reds. No hemolysis in 1 per cent saline. Hemolysis began in .6 per cent saline and was complete in .4 per cent saline.

8-27-23. R.b.c. 2,400,000, w.b.c. 15,000. Hemolysis began at .7 per cent and was complete at .34 per cent.

9-25-23. Hemoglobin of 66 per cent, r.b.c. 4,000,000, w.b.c. 16,600. Occasional microcytes. Hemolysis began at .48 per cent and was complete at .38 per cent.

UROBILINOGEN EXAMINATION

Duodenal contents.—

1-3-23. Urobilinogen negative. Urobilin 1,700 degrees.

1-9-23. Urobilinogen negative. Urobilin 2,800 degrees. *Feces.*—

8-20-23. Urobilinogen 4,800 degrees. Urobilin 5,200 degrees. Total 10,000 degrees.

8-22-23. Urobilinogen 8,000 degrees. Urobilin 4,800 degrees. Total 12,800 degrees.

8-23-23. Urobilinogen 7,600 degrees. Urobilin 4,000 degrees. Total 11,600 degrees.

8-24-23. Urobilinogen 8,000 degrees. Urobilin 4,800 degrees. Total 12,800 degrees.

8-27-23. Urobilinogen 7,200 degrees. Urobilin 6,000 degrees. Total 13,200 degrees.

9-5-23. Urobilinogen 4,400 degrees. Urobilin 5,200 degrees. Total 9,600 degrees.

9-7-23. Urobilinogen 2,400 degrees. Urobilin 4,800 degrees. Total 7,200 degrees.

On October 24, 1923, the hemoglobin showed 56 per cent, r.b.c. 3,800,000. At this time I removed the child's spleen under ether anesthesia. The following day the hemoglobin had dropped to 40 per cent, r.b.c. 3,000,000, and from this time on there was steady improvement in the blood picture. The fourteenth day following operation the hemoglobin was 63 per cent, r.b.c. 4,400,000, w.b.c.

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, April, 1925.

24,000, many microcytes, few macrocytes, no nucleated reds, no polychromatophilia.

The family history in this case was of interest. The father and mother, each aged 29, had been married in 1917. The first child was born in June 1919, a male, became jaundiced and died at 11 days, the jaundice being persistent. Twin boys born May, 1920, were normal, but suffered from icterus neonatorum. The paternal grandmother had one child, normal at birth but which developed jaundice at three weeks and died at six weeks.

Diagnosis—hemolytic jaundice.

Two main forms of this disease are recognized at the present time: (a) the congenital, or familial type, of Mikowski; (b) the acquired type described by Hayem and Vidal.¹ While there may still be some question as to the relation of these two types, it appears to be the consensus of opinion that certain facts to date warrant such a classification. The congenital, or familial type, of which the case reported is an example, is stated to be twice as common as the acquired form.

Clinically, the types are very similar, but the onset is different. In general the congenital type is "exceedingly chronic (Moynhan²) in its duration and quiescent in its manifestations," while the "acquired form may begin abruptly and run an eager rapid course from the first." "Anemia quickly becomes profound, the red cells falling to one million within a few weeks." "The crises of pain, temperature and deepened jaundice are more frequent than in the congenital type."

The essential clinical features of hemolytic jaundice are:

1. Fragility of the red blood cells, the most characteristic feature.
2. Acholuric jaundice, *i.e.*, jaundice with stools and urine unaltered in color, no itching or bradycardia. Urobilin, however, is present in the urine, signifying marked hemolytic action, the exact whereabouts in the body at present unknown.
3. Enlargement of the spleen.
4. Anemia.

Fragility of the red blood cells, a diminished resistance to hypotonic salt solution, is stated to be, by some authorities, a constant feature of the blood. However, Elliott and Knavel, in a most excellent review of the literature and report of cases, state that fragility is not constantly increased in all cases of hemolytic jaundice. It was not materially increased in two individuals of a certain family. It is, therefore, likely that the degree

of fragility changes from time to time in certain cases. In the case here reported, Dr. Anderson found, as has already been stated, that the fragility tests on two occasions were normal. Increased fragility may be found in other conditions, but is unusual.

Jaundice being acholuric differs fundamentally from that of ordinary obstructive jaundice. There is no bile in the urine or feces. There does not occur the intense itching of the skin. The jaundice is not so intense, but is of a more yellowish color, although at times in the acquired form it may show an intensification during the crises which appears to be the result of increased or massive hemolytic activity. Accompanied by fever and pain, the picture at such times may most strongly suggest mechanical obstruction of the bile ducts, and the differential diagnosis may be difficult, or impossible.

The congenital or familial type seems to run a more placid course with less disturbance, and as Chaufford has stated, "they are more jaundiced than ill"; and, as Moynhan puts it, "patients suffering from this type are frequently as little concerned about their yellow skin as they are the color of their hair and may consult a physician only for some other malady." Many such patients live quite comfortably their allotted time, dying from some other cause. However, Boyd reports characteristic severe crises in the familial type.

The majority of such types, however, sooner or later suffer some additional distress from changes which are secondary in the liver. Gallstones are present in a large percentage of cases as well as fibrosis and cirrhosis.

Urobilin is present in the urine and is usually increased when crises occur.

The spleen in hemolytic jaundice is moderately enlarged, increasing in size during the crises, and while easily palpable is seldom painful or the cause of discomfort except at time of crises.

Anemia.—The case reported gives a fairly typical blood picture with the red cells falling to 2,000,000 or less, although often the count remains between 2 and 3 millions. The white count increases, as a rule, as the red count falls, and decreases relatively as the red count increases, as was noted in this case. Bone marrow stimulation appeared when the red cells fell to 2,000,000, disappearing when the count by transfusion reached 4,000,000.

The anemia is due to hemolysis. What causes it is still the question, some observers laying the fault entirely to the spleen, others to instability of the blood. However, there seems to be much evidence in favor of the former theory, for certainly, upon removal of the spleen, the clinical results in this type of splenomegaly are so gratifying that one is convinced that the main offending element is eliminated. To say it is a surgical satisfaction is putting it mildly. The results at times are dramatic.

The treatment in cases requiring attention is surgical. Not all cases of this disease seek aid and they may not suffer sufficiently to attract or demand attention, and may submit to their malady feeling it is their cross to bear through life. However, once the diagnosis is made, surgery is indicated. Splenectomy is a specific for hemolytic jaundice. Kanavel's collection of cases, the Mayo Clinic statistics, with other periodical reports of cases, such as this, is sufficient evidence that by proper surgical aid the results are most striking. Kanavel's reports show two deaths in forty-eight cases. The Mayos report two deaths in forty-nine cases.

Ordinarily, in the majority of cases, splenectomy is not a difficult operation. However, as in appendectomy, certain conditions, the result of adhesions, infection and anatomical relations, may present the most formidable and dangerous surgical and technical difficulties, and tax the surgeon's dexterity and ingenuity.

The case herein reported was splenectomized at the age of fifteen months. Under ether anesthesia the left rectus incision extended from the left costal margin down close to the anterior superior spine of the ilium. Upon opening the peritoneum hematomas and blood clots were noticed free in the peritoneal cavity with adhesions to the parietal peritoneum and to the surrounding viscera. There were several rather soft adhesions between the small bowel and the bladder. There were adhesions between the omentum and the parietal peritoneum; a rather recent blood clot was present in the omentum; there were adhesions from the hilum of the spleen to the parietal peritoneum anteriorly, to the diaphragm and from the spleen to the parietal peritoneum posteriorly. The perisplenic adhesions were firmer than the textbook account of such a condition. The spleen extended from the dome of the diaphragm to a point three fingers' breadth below the left costal margin. It was freed ante-

riorly from the stomach wall, posteriorly from the pancreas and surrounding vessels; the posterior and anterior vessels were ligated separately, being careful to omit tying the tail of the pancreas. The peritoneum was closed with plain catgut, the fascia with chromic; four silkworm sutures and the skin was closed with plain catgut.

Post-operative diagnosis: Familial hemolytic icterus; chronic splenitis with adhesions to the parietal and visceral pleura.

Following the operation there was a marked increase in the pulse rate, with a temperature of 102 the first day. Then improvement came rapidly, both pulse and temperature becoming normal. By the fourteenth day the red cell count had risen to 4,400,000, the white cells were 24,000, and the hemoglobin 63 per cent. The surgical wound healed without interruption. The child has remained well and this last week, now twenty months since operation, is well (hemoglobin 80 per cent, r.b.c. 5,000,000, w.b.c. 20,000).

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DISCUSSION

DR. ARTHUR N. COLLINS, Duluth: I think this is the second thrill of the afternoon. We have heard the earliest case of splenectomy for this or any other type of splenic disease reported, and have also had called to our attention the work of Dr. Mann, which is exceptionally good, and of which we hope to hear more. Dr. Wilcox' case brings out a point I think we should take note of, and that is transfusion into the abdomen in children. As I remember, the literature states that these clots absorb very slowly. It is a question whether only the recent clots were present at the time of operation, or some of the older ones also.

Since 1913 the view concerning these cases has changed somewhat. This is a hemolytic and not an obstructive jaundice, as the name implies. Johnson, of Pittsburgh, reviewed considerable of this work and reported a case of hemolytic jaundice in a man, aged 23, whose sister also had jaundice. He had no bile in the urine. The Wassermann reaction was negative, as is usual in these cases. The spleen was enlarged, extending past the midline and below the umbilicus. X-ray therapy was used and decreased the size of the spleen, but this was accompanied by increase in the jaundice. Johnson states that after splenectomy in the acquired familial type the fragility of the cells has been corrected and their normal resistance to hemolysis restored. However, in this congenital type we have to remember that the normal fragility may not be restored by splenectomy. The red blood cells in this disease are abnormally fragile, while in the obstructive jaun-

substance produced in excess by the spleen, which renders it an easy prey. As noted by Johnson, this fragility tends to disappear, after splenectomy.

There is a diffuse fibrosis of the spleen in hemolytic jaundice. In 1887, Spencer Wells, in England, performed splenectomy for this condition, and it was performed again in 1895 by Bland-Sutton. Since Banti, in 1903, there have been numerous splenectomies for this condition. Splenectomized patients have been traced for from two to five years and many patients have apparently been in good condition. Banti's first case was reported in excellent health eight years after operation. A case was reported by Laws and Bates before the Philadelphia Academy of Surgery in 1923, an acquired hemolytic jaundice in an adult, in which repeated transfusions were done in an effort to bring the patient up to a point where splenectomy might be done, the transfusions failed and the patient continued to grow worse. In one of the later transfusions the patient went into shock after about 8 c.c. of blood had been injected. During the discussion among the members of the Academy it was brought out that the cases one wishes to splenectomize are the very ones that are likely to have the greatest difficulty with reactions from transfusion, and this may occur after the first two or three transfusions have been successful.

I have had no personal experience with hemolytic jaundice. The few splenectomies I have done were for other conditions. The technical difficulties of splenectomy are not insurmountable if one is careful. The blood supply is from the celiac axis and the tail of the pancreas is in close proximity. According to Sir Berkeley Moynhan, splenic adhesions are not so common in this condition as in some others, in pernicious anemia, for example. I have found it of advantage to leave a hot pack in the splenic fossa for a few minutes after the spleen has been dislodged. This helps to check the oozing of blood. The jaundice should clear up within a week following operation.

This is an unusually interesting case of Dr. Wilcox's, occurring in so small a child. There was no bile in the

dice the cells are resistant. This may be due to some urine or feces and it is undoubtedly a case of hemolytic jaundice. We are very fortunate in having had it placed on record before this Association.

DR. H. M. CONNER, Rochester: This case is of interest to the internist as much as to the surgeon. I wish to emphasize the fact that acquired hemolytic jaundice is, in our experience, probably more common than the familial type. In the last few months we have seen two very severe cases. A young woman took sick with acute jaundice, which cleared up after a time. She then had another attack during which her hemoglobin was very low and her temperature high. By means of a number of transfusions, I think eight or ten, we got her to the point where we felt safe in doing splenectomy. It seemed that the blood was destroyed almost as fast as we could pour it in and we had to transfuse her every three or four days. Following operation she has now made, so far as I know, a complete recovery. We have not seen her for three or four months.

Another case, the oldest in our knowledge, was that of a man seventy-six years of age, who came in with a jaundice which began about two months before he came to the Clinic. He gradually failed, much like a case of pernicious anemia, which was our first diagnosis. He was very weak, the hemoglobin was very low and the index was high. It was only the very high percentage of reticulated cells in the blood, a little over 80 per cent, and the marked increase in fragility that gave us the right diagnosis. This man did not respond, as does a case of pernicious anemia, to transfusion. Many transfusions failed to raise the blood count because he destroyed the blood as rapidly as it was poured in.

I wish to emphasize the fact that we are on dangerous ground when we make a diagnosis of hemolytic jaundice in cases that show no increase in the fragility of the cells. Such cases do occur, such as that of Dr. Wilcox, and I wish to congratulate him for putting on record the youngest case of hemolytic jaundice that has been operated. Undoubtedly, these cases do occur, but they are rare.

COLLODAURUM

From the circular matter that is sent out for Collodaurum by the Ideal Skin-Suture Material Company, Two Rivers, Wis. (which acts as the distributor for the Kahlenberg-Klaus Company, Two Rivers, Wis.), it appears that Collodaurum is essentially the same as the product formerly marketed as "Colloidal Gold." The "colloidal gold" of the Kahlenberg-Klaus Company was reported on by the Council on Pharmacy and Chemistry. The Council reported that the manufacturer of "colloidal gold" referred to a publication by Dr. E. H. Ochsner as evidence for the claim that the remedy has proved far superior to the roentgen ray and radium in the treatment of inoperable cases of cancer and also as a "postoperative treatment." This evidence showed that until more critically studied cases, supported by microscopic examination of the tissues, are reported, in which there has been demonstrable retrogression or disappearance of the tumors, there is no reason for believing that "colloidal gold" offers anything more in the treatment of carcinoma than do the other colloidal preparations that have preceded it. (*Jour. A. M. A., Sept. 26, 1925, p. 997.*)

WHAT DO PHYSICIANS PRESCRIBE?

The impression seems to be prevalent, although without any definite evidence, that physicians are again tending to the prescribing of ready-made formulas, and that the art of pharmacy is becoming less and less a necessity to modern medical practice. A survey made under the Commonwealth Fund is, therefore, interesting. One thousand prescriptions (one hundred from a state) were examined: 51.9 per cent contained only official ingredients; 29 per cent contained both official and non-official ingredients; 19.1 per cent contained only non-official ingredients. The study was extended, and 17,577 prescriptions were found to contain 40,454 ingredients of which but 10 per cent were proprietary. The study also indicated that the filling of prescriptions is not, as has been believed, largely a matter of transferring a proprietary or secret formula preparation from one container to another. The results of the investigation indicated that physicians are holding in a large measure to the ideals urged on them by their instructors and emphasized by the Council on Pharmacy and Chemistry. (*Jour. A. M. A., Sept. 5, 1925, p. 750.*)

TUMORS OF THE TESTIS: MALIGNANT AND INFLAMMATORY*

F. C. SCHULDT, M.D.
St. Paul

Considerable effort is being spent by the American Society for the Control of Cancer to enlighten the public on early cancer formation. Radio broadcasting by members of the profession has been instituted. Volumes have been written by research laboratories, physicians, surgeons and radiologists, and still we feel a tremendous handicap when an advanced malignancy of the testis presents itself.

In an endeavor to have all the cases of malignant testis on record, I wish to here present one case of malignant tumor of the undescended testis. In addition, I shall report one case of tuberculosis of the testis and one of an inflammatory tumor of gonorrheal origin.

The extreme malignancy of carcinoma or embryonal teratoma testis, due in part to the far-reaching and hidden lymphatic system of this region, calls forth the best that surgical knowledge and skill can furnish in attempting to prolong the life of the patient.

In the brief space of time allotted to me, I shall touch upon salient features only, bringing to your attention some of the outstanding facts in the literature.

Case 1. Mr. C., aged 20, was first seen September 29, 1924, complaining of a pain in the lower left quadrant of the abdomen. In July, 1923, he had been operated on for a left sided hernia and his surgeon reported to me that there was a mass in the left side of the scrotum which consisted of a hematoma. Microscopic examination at that time confirmed the clinical findings. The patient stated that he had never had a testicle on the left side of the scrotum, but had had, as long as he could remember, a lump, which he accurately pointed out, corresponding to the region of the internal ring. When he was a small child his mother sought medical advice and was told that this mass was an undescended testicle and that when it should get larger it would come down into the scrotum. A month before he had noticed the lump enlarging, becoming elongated and sausage shaped. This, as he pointed out, reached nearly to the external ring. In several attacks during the previous two months he had suffered severe pain on defecation. He had had no fever or chills at any time; no nausea or vomiting. He had worked every day. After a long auto ride he noticed extreme tenderness and suddenly he was aware that the scrotum was filled with

something. At that time he sought medical aid and the operation followed. The undescended testicle probably had become malignant and the trauma of the ride caused a hemorrhage.

On September 29, 1 found, on rectal examination, a mass occupying the left pelvis about the size of an orange. This mass was very tender, semi-fluctuating, and reached a little beyond the midline and nearly up to the umbilicus. The mass was slightly movable on examination. Venereal infection was denied. The leucocyte count was 18,000. No occult blood was found in the stool. An opaque enema showed under fluoroscopy no obstruction in the bowel, but the sigmoid loop pushed to the right side.

Upon operation, October 1, 1924, an incision was made mesially to the former incision and here was found a large fluctuating mass occupying the left pelvis retroperitoneally. The tumor, bluish in color, was freed with some difficulty. It was attached by a pedicle which proved to be the cord, as the vas and epididymis could be recognized. It was now evident that we had further metastasis in the posterior wall of the bladder to which the tumor was attached. This area corresponded to the region of the right seminal vesicle and was about the size of a half dollar, a metastasis contact. No other masses were felt.

Pathological Diagnosis: Malignant testicular tumor, carcinoma type, of undescended testis on the left side.

A large tube was placed for radium to the back of the bladder and radium was applied at the pedicle at once. In a few days radium was placed into the tube back of the bladder. In all, he received 1,475 mg.h. of radium.

During October he was given crossfire x-ray, 20 m.a.h. in all.

On December 2, a good-sized mass could be palpated on rectal examination corresponding to the implantation on the bladder. This was very tender. He was given 16 m.a.h. in December.

On January 3, he was suffering much pain in the lower abdomen. On rectal examination there could be felt in his pelvis three distinct tumor masses, which were very tender. General appearance of patient was not favorable. He was losing weight and looked very pale. He had a distinct pain and tenderness over the right hypochondrium, which suggested metastasis along the lymphatic chain. He was too weak to come to the office for treatments, so he went to the hospital, where Dr. E. Schons gave him 36 m.a.h. over a period of nine days. His skin had become quite bronzed, having received 72 m.a.h. of x-ray, in all.

January 30, 1925. On rectal examination, there is a pronounced shrinking of the tumors. He feels better and eats better. In fact, he feels well enough to run his car.

On February 12, he complained of more pain in the abdomen and a pain in his chest of a week's duration. X-ray of chest failed to reveal any lesions.

May 24, patient died. Extensive metastasis of retroperitoneal glands.

Case 2. Mr. H., aged 39, was injured in his right groin by falling against the corner of a show-case, about the end of May, 1923. I saw him June 18, 1923, when he complained of a pain in the right groin extending into the right scrotum on lifting. He stated that the testicle became swollen after the injury and he felt nauseated. He had had a gonorrhea seven years before.

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, April, 1925.

Examination revealed two hard nodules in the right epididymis, tender to the touch. The corresponding seminal vesicle was indurated and tender on pressure, while the left side was normal. The blood Wassermann was negative.

In view of his history of gonorrhea and his injury, a diagnosis of an inflammatory tumor was made, possibly of a tuberculous nature, since the seminal vesicle seemed involved.

On June 27, the right testicle was exposed and in the globus major of the epididymis were found two small nodules, the size of small hazelnuts. These appeared inflammatory and an epididymectomy was done, including a portion of the vas. Wound healing was complete.

The patient made an uneventful convalescence. No x-ray or radium was given. It is now twenty months since the operation. On a recent examination to determine the exact status, I found a healthy appearing man with entirely negative findings in the scrotum; on rectal examination, the prostate and seminal vesicles were normal with clinically no masses in the retroperitoneal region.

There was some difference of opinion at first regarding the malignancy of the tumor. The microscopic picture in some areas showed a very cellular tumor, although no mitotic figures appeared. Certain areas showed ducts of the epididymis surrounded by dense thick layers of fibrous tissue. The tubules and stroma were filled with polymorphonuclear leucocytes. The diagnosis of an inflammatory tumor due to latent metastatic gonococcus infection was made by Dr. E. T. Bell, Professor of Pathology at the University of Minnesota.

Case 3. Mr. U., aged 20, was seen for the first time May 24, 1922. He complained of pain and swelling in the left testicle and a pussy discharge. Five months previous he injured the testicle severely by accidentally striking a chair against it. This caused immediate pain and swelling and soreness followed. He did not reveal this to anyone until a pussy discharge appeared five months after the injury. His general health then was not good. In fact, his mother noticed his reluctance to participate in activities with other boys. The discharge began three days prior to his coming to the office. The pus was of a flaky nature, which at once suggested a tuberculous infection. A large sinus in the indurated scrotum led into the region of the epididymis. The right testicle and epididymis and both seminal vesicles were normal. Albumin was present in the urine.

On June 2, the left cord, epididymis, testicle and a good portion of the scrotum were removed. Wound healing was good and his general condition improved rapidly.

On July 10, five weeks after the operation, the right scrotum became enlarged, containing a fluid. With a trocar, two ounces of clear fluid were removed. It was evident, however, that there was further pathology present. Aspiration was repeated in three days, but a week later the fluid had again accumulated.

An operation was performed on the right side July 21. A hydrocele was excised. It was noted that the epididymis was hard and tuberculosis was feared, but it was not excised, as my feeling of conservation was rather keen at this time.

Progress was favorable until October 13. The right side

was then much swollen, the epididymis hard and a pain radiated into the lower abdomen.

On October 28, the testicle was made free and the epididymis dissected free from the testicle. An abscess containing about one dram of pus had broken into the testicle. This area was cleaned out, iodoform powder applied, and the wound closed completely.

By December 28, 1922, the wound was closed, the testicle was in good condition, the seminal vesicles normal.

February 3, 1925. A painful gland was found in the right groin, the seminal vesicles were both very hard, but only moderately tender. Temperature was normal. It was noted that the seminal vesicles could be palpated with precision bimanually, the mass being about 0.5 inch in thickness. For over a period of two years he had been in excellent health, taking on much weight and growing in stature considerably. A urinalysis sediment revealed two definite palisaded tubercle bacilli. X-ray of the chest showed some tiny healed calcified nodules, but no active lesion.

Embryologically the testicle develops from mesenchymal tissue to the inner side of the urogenital fold, retroperitoneally along the lumbar spine. In its descent it carries with it the tubules of the mesonephros which, in the male, become the epididymis, while the mesonephric duct or Wolffian duct becomes the vas deferens. The site of its embryological development was its closest connection to the lymphatic glands, and after its descent the distance does not alter its direct communication with the primary lymph nodes which lie along the spine upon the large vessels.

The descent of the testicle may be incomplete. It is found in the cul-de-sac of Douglas with a very short pedicle.

Edington¹ reports a malignancy of an abdominal testicle that he found posterior to the bladder, to which was attached epiploes of the sigmoid. From here in its descent the testicle may halt in any position within the canal, the commonest site being at the internal or external ring.

Testicular tumors are classified into three general groups: malignant, inflammatory and benign.

Hinman makes the following classifications:

A. Malignant group—

1. Seminoma or unicellular origin.
2. Teratoma or derived from two or more layers.

B. Inflammatory—

1. Tuberculosis.
2. Gumma.
3. Hydrocele.
4. Hematocele.
5. Gonorrhea.
6. Traumatic.

C. Benign—

1. Fibroma.
2. Lipoma.

The diagnosis of tumor of the testis is not difficult, but the differential diagnosis between lues, tuberculosis or malignancy requires all the technic of precision that is known to clinical and laboratory experts. In reading the literature we see with regret the mistakes made in considering the tumor benign where the delay was a priceless error.

Of all carcinomata, this is the most malignant, due to its specific embryonal type. No effort should be spared, no means of diagnosis overlooked in an attempt to make an early diagnosis. At all times when confronted with a case of testicular tumor we should thoroughly examine three body areas: (1) the scrotal contents; (2) prostate and seminal vesicles; (3) the retroperitoneal region (by palpation).

Transillumination should be used whenever possible, but it is not always reliable, as a hematocele would not transmit light, while a malignant tumor containing cartilage and pockets of mucoid material might. In tuberculosis, growth is more rapid and may be associated with slight temperature. These tumors are tender to the touch.

Tumors of the testicle occur at all ages. Hinman² quotes the most likely period from the age of twenty to fifty. Malignancy occurs on one side only, but a bilateral malignancy of carcinoma type is reported by Tanner³ dating back to trauma. The radiating pain of metastasis is important to note, as it simulates either gallbladder disease, appendicitis or a duodenal ulcer, and may also simulate pain of the kidney area.

The inflammatory changes of the testicle have been well classified for some time past, but in neoplasms Tanner⁴ regrets that the ontology and classification is not so good.

All cases of doubtful diagnosis should have a blood Wassermann test, since several articles have reported finding a gumma after an extensive operation for malignancy had been done.

Rathburn⁵ reports two cases of testicular tumor in both of which the diagnosis could not be determined without microscopic examination.

A rather extraordinary finding is reported by Zausch¹³ in a young man of 21 years, who developed a right sided testis tumor and at the same time a retroperitoneal tumor. A rapid decline and death followed. The autopsy showed a teratoma of the testicle, a retroperitoneal tumor the size of

a child's head, which microscopically was identical with the testicular tumor in age and structure. This established the fact that this was a multiple malignant tumor, not a metastasis. He determined that the tissue age in both was identical and that both had their origin from identical embryological tissue, a germinal rest remaining *in situ* at the time of the descent of the testicle. The large metastasis in the liver was of much larger cells and did not have a teratoma nature.

FREQUENCY

Delafield and Prudden report the ratio of non-descended to descended testicle as 1 to 500, while Edington¹ puts the ratio of malignancy of undescended to that of the descended testicle as 1 to 5.5. Malignant tumor of the testicle they found to be rare, about 1 in 2,100 of all male admissions.

Lund had not seen a malignancy in an undescended testicle in twenty-seven years, but in a period of four years following saw four cases. He made an attempt at establishing the percentage ratio of the malignancy in the normal to the abnormal position. He determined that malignancy presents itself 10.3 times more frequent in the normal than the abnormal position. However, the ratio of the undescended to the normal position being 1 in 500, malignancy occurs in a higher percentage in undescended testicles. Bowing⁶ states that malignancy of the undescended testicle constitutes one-third of testicular malignancies.

Trauma has been an outstanding etiological factor both in malignant tumors and tuberculosis of the testis. This is due to the exposed position of the testicle, the undescended gland lying in the inguinal canal being constantly traumatized, while the intra-abdominal gland receives no trauma. Tanner⁴ states that the testis in the abdomen is immune, the testis in the scrotum more or less susceptible, while when the gland is in the inguinal canal it is very prone to malignancy. In Case 1 the site of the testicle was at the internal ring.

TREATMENT

One is struck by the little attention that is given in the literature to etiology, symptomatology and diagnosis of these conditions. Considerable space is devoted to treatment. Surgery is dominant in all malignant and inflammatory tumors whatever else may be done in addition. Radium, x-ray and vaccines are employed with considerable success.

Hinman⁷ recites three historical periods of radical surgery:

1. Attempts to remove appreciable abdominal

metastasis. To this period belong Kocher, Tuffier, Morris, Witzel, Bland-Sutton and others.

2. In the second period we have advocates of the high cord excision.

3. The third period has developed the present radical lymph node extirpation based upon a thorough knowledge of embryology and anatomy.

After single castration did not reduce the frightful mortality, and after the high cord excision had not influenced the abdominal metastasis, the more radical procedure of lymph node excision was evolved.

To one having a knowledge of the development of the germinal gland, its embryological position and changed adult position, it is not a disillusionment to find metastases in lymph nodes lying upon the large vessels as high as the inferior mesenteric artery and even higher. Upon this fact Hinman has worked out a radical operative procedure. The technic consists in extending the inguinal incision upward parallel to the twelfth rib. Dissection is carried down to the peritoneum and the peritoneum with intestines enclosed is pushed to the opposite side. The ureter follows the peritoneum. This exposes the vessels and the lymphatic region involved. Theoretically, it would be better to dissect from above downward, but it is more practical to dissect the glands from the vessels from below upwards.

This dissection method is also followed by Bastianelli.

Hinman⁷ claims for this radical operation a 100 per cent improvement over simple castration, because in 50 per cent of cases in which there is a malignant tumor of the testicle the retroperitoneal glands are involved. Fifteen per cent might be cured by orchidectomy, but there is no statistical guide that can select these favorable ones. With the remote glands involved so early and even the remotest glands at times first affected, it seems futile to do a simple castration.

Lipschutz⁹ tells us that where the malignancy is on the left side the lymph nodes are placed higher than on the right side in two-thirds of the cases.

Hinman² advises that where abdominal metastasis has taken place the radical operation should not be attempted. Tanner⁴ also holds that radical operation should not be done when clinical metastasis can be recognized.

From a prophylactic standpoint the undescended testis should be removed if it can not be comfortably brought into the scrotum. Lund¹⁰ advises

that, after puberty, if the other testicle is normal in position and size, the gland should be removed.

Coley¹¹ feels that a 10 per cent mortality in radical operation is still high and thinks that better than radical operation is simple orchidectomy followed by treatment with his combined vaccine of bacillus prodigiosus and streptococcus erysipellidæ. Added to this, massive radium packs should be given over the abdomen and left supraclavicular space. This adds no mortality. The vaccine has a tendency to retard or prevent further growth of the malignant tumor. "The inhibiting power," he says, "has been absolutely demonstrated, but is not sufficiently powerful for a permanent cure.

Bowing⁶ is enthusiastic over radiation. Hinman⁷ points out that the highly specific action of radium on testicular tissue is productive of beneficial effect especially in the seminoma group. The teratoma group is more resistant and spreads more rapidly than the unicellular tumor. The prognosis is extremely bad. In Kocher's fifty-five collected cases there was not a cure.

Various reporters record in the follow-up method statistics 5.5 per cent living after four years, which gives us in the end-results of five years of life a mortality of 94.5 per cent. Hinman feels optimistic. Although his operative mortality in the first group was 12.6 per cent, he had a series of six cases with no operative mortality and the operative result all patients in good health, although in four cases retroperitoneal lymph nodes were involved.

Tuberculosis of the genital tract is also a difficult problem. The clinical finding of a tuberculous epididymitis is not considered an early finding. Young has pointed out that the primary focus usually is in the seminal vesicles, whence it may spread to one or both epididymes, to the prostate gland and bladder, to one or both kidneys and from there become a general disseminated tuberculosis. Guyon, the father of modern urology, preceded Young in this opinion. Young has, for some years, advocated the extensive resection of both seminal vesicles and has worked out a technic for removing the vas in toto together with both epididymes and terms his operation epididymovesiculectomy.

CONCLUSIONS

1. Carcinoma and embryonic teratoma of the testis is one of the most malignant of all neoplasms.

2. When a testicular tumor presents, examine with all diligence the scrotal content, prostate and seminal vesicle region and the retroperitoneal space.

3. The primary lymphatics are far removed from the normal site of the testicle.

4. The occurrence of malignancy in undescended testicle is rare, but the percentage of malignancy is much higher than in testicles in the normal site.

5. The primary site of tuberculosis of the seminal tract is in the seminal vesicles.

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DISCUSSION

DR. E. T. BELL, Minneapolis: These enlargements of the testis and epididymis may be approached from the clinical standpoint to the best advantage. An enlargement on one side of the scrotum may be either testis or epididymis. Sometimes we can tell which organ is enlarged and sometimes not. These are the things we have to consider:

1. *Hydrocele*, which can usually be demonstrated readily by transillumination.

2. *Tuberculosis*, which involves the epididymis almost exclusively. It may give rise to fusion with the skin and fistula formation. We may be able to demonstrate enlargement of the seminal vesicles and thus help in the diagnosis. Tuberculosis of the epididymis does not give rise to a very large tumor.

3. The *gumma* develops almost invariably in the testis, while tuberculosis is almost invariable in the epididymis. We have several specimens of the testis removed with the diagnosis of neoplasm which turned out to be gummas. The Wassermann test will prevent that error.

4. A chronic epididymitis may give us some difficulty in diagnosis. The involvement is usually in the epididymis.

5. The neoplasms are called mixed tumor, embryoma

or teratoma. They are called mixed tumors because several kinds of tissue are present. Nearly all have epithelium and some have cartilage. The term "mixed tumors" is appropriate, for all have more than one kind of tissue.

There is no very satisfactory subdivision of the neoplasms. There may be a true dermoid cyst, in which case we know they are benign, or there may be a cyst lined with epithelium in which there may be carcinomatous tissue. We must be careful to examine the entire specimen to be sure that there is no carcinomatous tissue in it. Unfortunately, these adult types are very rare compared with the malignant forms. The majority of these will have carcinomatous epithelium, as Dr. Schuldt showed you. Occasionally a sarcoma is seen.

The relation to trauma was emphasized by Dr. Schuldt. This is a tumor which occasionally is due to injury. In one of our cases there was injury at the age of fourteen from a baseball bat. The testis remained small for ten years and then began to grow. We get such histories often. With a history of severe trauma the patient should be watched and we may be able to pick up the tumor before it gets to the inoperable stage. I think we are justified in removing an undescended testicle in the inguinal canal. As soon as the tumor begins to enlarge it will slip down into the scrotum or back into the pelvis.

A bilateral tumor is more apt to be a gumma. The mixed tumors are usually large, fleshy, soft growths. A very marked enlargement indicates a neoplasm.

The prognosis is extremely grave. From 80 to 90 per cent of these patients die of metastases.

DR. GILBERT J. THOMAS, Minneapolis: I think we are very fortunate in having such a case reported, because Dr. Schuldt so carefully stated his case and so carefully reported the findings.

I have recently heard Dr. Dean and Dr. Barringer read a paper and discuss tumors of the testicle. They have cut down the mortality by their method of using x-ray or radium before operation. They have a number of three and four year cures following this method of treatment. They believe it unnecessary to do the operation described by Hinman and think the mortality is not less than when x-ray or radium is used to control the metastasis when it occurs. They find that about 30 to 40 per cent of their cases occur between thirty and forty years of age. Of the cases they studied 10 per cent occurred in the undescended type; they did not tell us whether in the abdomen or the inguinal canal.

I have always wanted to have Dr. Bell present when a tumor of the testicle is explored so that we may be sure of our diagnosis. I had him see a case with me three years ago. This patient has gone over three years without evidence of metastasis and is in perfect health.

We have recently explored a tumor of the testis which turned out to be a hydrocele, with no evidences of malignancy. At present I have a man of twenty-eight with a tumor as large as a big grapefruit, with metastasis in the right abdomen. He is receiving x-ray and radium therapy, which has improved his general condition and has reduced the size of the tumor.

DR. F. C. SCHULTZ, St. Paul (closing): I can add nothing to what has already been said, but wish to thank the gentlemen for their discussion.

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION, SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN MINNESOTA MEDICAL ASSOCIATION, AND MINNEAPOLIS SURGICAL SOCIETY

Owned and Published by
The Minnesota State Medical Association
Under the Direction of its
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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

Vol. VIII	NOVEMBER, 1925	No. 11
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EDITORIAL

The Inter State Post Graduate Assembly

The meeting of the Inter State Post Graduate Assembly in St. Paul in October more than fulfilled expectations. The name of the Assembly has again been changed and is in the future to be known as the Inter State Post Graduate Medical Association of North America. Paid registrations this year numbered 1,650 in contrast to 1,565 last year in Milwaukee. The growing popularity of the meeting is likely to tax the seating capacity of the largest auditorium in the future, but we are assured that the Auditorium in Cleveland, where the Association is to convene next year, will be able to accommodate the large attendance which is already assured.

Perhaps the most striking feature of the meeting this year was the industry displayed by those in attendance. The main floor of the municipal auditorium in St. Paul had its 1,200 seats filled and the balcony was called upon to take the overflow each

day. Those who wished good seats had to come early. No one who had not attended previous meetings of the Association would have predicted that physicians as a whole had such powers for absorption of knowledge as was displayed. One would have supposed that clinics and lectures from 7 A. M. to 10 P. M. with a scant hour for lunch and supper would have been too much of a good thing. Such was not the case, however.

Clinics in surgery, medicine and the specialties followed each other in rapid succession. Listeners were able to hear the latest interpretations of problems in almost every branch of medical science—an experience which was valuable even to the specialist. About half the addresses were in the nature of clinics and patients with all sorts of afflictions were demonstrated from the standpoints of physical and laboratory examination, diagnosis and treatment by men, many eminent and some less well known, but all professors or associate professors in medical schools of the United States and Canada.

It would be futile to attempt a detailed account of this five-day meeting. Differing opinions were expressed. The outstanding example was the difference of opinion as to the treatment of peptic ulcers. Dr. Deaver of Philadelphia, in his characteristically forceful and engaging manner, proposed that physicians as a whole had such power for the surgical treatment of all such ulcers with gastro-jejunostomy, combined where possible with excision of the ulcer, and gave as his reason the macroscopical and microscopical evidence of lack of true healing in specimens he had removed. Dr. Bevan of Chicago, also an eminent surgeon, recommended dietary treatment in all non-obstructive ulcers and stated that 80 to 90 per cent can be counted on to get well. Dr. Crile of Cleveland emphasized the value of gastric resection with removal of most of the acid-secreting portion of the stomach in patients having symptoms of marginal ulcers following simple gastro-jejunostomy. The problem of the best routine treatment of peptic ulcer has evidently not been finally settled.

The gallbladder came in for its full share of attention. The place held by the appendix a few years ago has been taken by the gallbladder. Dr. Deaver is one of those who sees in the gallbladder a common cause of upper abdominal complaint

and believes in the more radical surgical treatment of this common offender. Dr. Judd, however, presented excellent statistics showing that the best results from gallbladder operations are obtained in patients who have had typical gallbladder attacks. Lyon's non-surgical drainage of the gallbladder received scant courtesy from his fellow townsman, Dr. Deaver.

The possibilities of thoracic surgery in the treatment of malignancies of the esophagus and cardia and the operation of extra pleural thoracoplasty for pulmonary lesions was brought out by Dr. Willy Meyer of New York.

Dr. De Lee of Chicago gave a most instructive address on some of the errors in obstetrical practice and made a plea for more frequent and thorough prepartum examinations, better aseptic technique, and pointed out the importance of conserving the natural immunity of the mother by paying more attention to her general condition and conserving her strength by less anesthesia, Credé expression and instrumentation. The early recognition and correction of occiput posterior presentations, a very difficult feat by the way, was emphasized in this respect.

It is to be regretted that more of the foreign guests could not attend. Lord Dawson, who incidentally possesses many of the attributes we Americans like to attribute to the high type Britisher, by his mere presence and practical suggestions as to the treatment of cardiac diseases, was most engaging.

Some seven hundred physicians and laymen, many accompanied by their wives, attended the banquet. The occasion proved a grand finale.

Dr. John Van R. Lyman of Eau Claire, Wisconsin, who succeeds Dr. Addison C. Page as president, was unfortunately prevented by illness from attending the meeting. Dr. Carl L. Larsen of St. Paul, through whose efforts as General Chairman of the Executive Committee the success of the meeting was largely due, was fittingly elected President-elect of the Association. Dr. Mather Pfeifferberger of Alton, Illinois, was chosen to succeed Dr. Roland Hazen of Paris, Illinois, on the Board of Trustees. In the future the president will appoint a vice president of the Association from each state in the Union and province in Canada. The invitation of the Academy of Medicine of Cleveland to meet there in 1926 was unanimously accepted.

International Peace

The subject of international peace is in the limelight of public attention just at present and although not a strictly medical subject is of such great importance that we may be pardoned for devoting some space to its discussion.

The whole purpose of all medical activities has been and always will be diametrically opposed to that of war. War is entirely destructive while the work of the medical profession is directed along lines of prevention and cure of human ills. During war the surgeon is called upon to repair as far as possible the damage done by shot and shell. In peace times preventive medicine has done an immense amount of good in preventing the occurrence and spread of contagious disease. The success in the control of such diseases as smallpox, typhoid fever, malaria, cholera and yellow fever is outstanding. The reduction in infant mortality should be mentioned. The combined efforts of the medical professions of the civilized world have saved the lives of thousands of human beings only to have the work many times undone by such catastrophies as the World War. Humanity has played the puerile game of setting men up only to knock them down again.

Recently Dr. Fosdick, speaking before delegates of the League of Nations at Geneva, stressed the essentially unchristian character of war. He was spokesman for many Americans when he said, "Here today, as an American, under this high and hospitable roof, I can not speak for my Government, but both as an American and as a Christian, I do speak for millions of my fellow citizens in wishing your great work, in which we believe, for which we pray, our absence from which we painfully regret, the eminent success which it deserves."

President Coolidge, in his magnificent address to the American Legion in Omaha, presented the subject of war and armaments from the viewpoint of a sane American statesman. Stressing the wantonly destructive character of war he emphasized the advantages of peace. He pointed out that when the military of any country becomes powerful enough to influence the civil government, the liberty of the people becomes threatened. The more democratic form of certain governments since the World War is one of the distinct steps towards international peace resulting from the war. But what a price was paid!

Our late vice president, Marshall, was once heard to remark apropos of his attitude towards war that if anyone insulted his wife he would fight. And so when it comes to defense of our wives and families and, to extend the group considerably further, our country, any red-blooded man can only conclude that defensive war is right. On the other hand, war for aggression is an assumption that might is right, and is absolutely wrong.

Those who see in a League of Nations or a World Court a means of putting an end to or even curtailing war are often accused of being idealistic and impractical. It is argued that war has always existed and always will. This sort of argument does not bear much weight with the medical profession. Clinging to the ways of our grandfathers would have paralyzed medical progress.

When it comes to differences between individuals no one maintains that the stronger individual should prevail. Man has instituted courts to administer justice and police to enforce court decisions. The only way to absolutely outlaw war is by the establishment of a world court with an international force to enforce its decrees.

It is pathetic to consider how many of our civilian soldiers fought during the World War with the feeling that they were, crusader-like, fighting to put an end to war, only upon their return to see a blind reversal of feeling which kept us out of the League of Nations. The issue was given a political aspect which it should never have had. Had constitutional methods been employed in directing our course in the matter, there is good reason to believe that we would now be members of the League of Nations.

The League of Nations has become a rather uninteresting and dead issue. Although the question of our adoption of the World Court on the Harding-Hughes-Coolidge basis has been before the Senate for two years the issue is not a dead one. It comes up in Congress under the head of unfinished business December 17, next. The proposition is not a political one or we would not be dealing with it here. The leading organizations of the country have endorsed it, including the American Bar Association, the Chamber of Commerce of the United States, the Commercial Law League of America, the American Manufacturers Association, the League of Women Voters, the American Federation of Labor, and others. The medical profession should and undoubtedly does endorse it.

The miraculous power that lies in an idea is coming to be more and more appreciated. If the idea of the justice embodied in a World Court becomes universally recognized, a damper will be put on future wars. War will not be entirely prevented without force to compel the acceptance of the decrees of such a court. But at that America's acceptance of the World Court idea will do much to spread the idea of justice rather than war as the settler of international disputes.

Eye, Ear, Nose and Throat Section

Attention is called to the addition in the near future of a new section in our "Progress" department to be devoted to abstracts of current literature on Eye, Ear, Nose and Throat subjects. In the previously conducted sections, there has been no logical place for abstracts in this specialty. Those interested in this line of work are urged to communicate with Dr. Virgil Schwartz, Physicians and Surgeons Bldg., Minneapolis, or Dr. E. L. Armstrong, Fidelity Bldg., Duluth, so as to avoid duplication in abstracting.

MISCELLANEOUS

THE LIBRARY OF HEALTH

Recently a request was received by the Journal for information regarding a publication called the "Library of Health, the Best Home Medical Book in Print," distributed by the Western Distributing Company of Chicago and edited by B. Frank Scholl, M.D. The book has been recently peddled by agents in the territory about Wolverton, Minnesota. Information received from the American Medical Association headquarters shows that the "Library of Health" along with such publications known as "Medicology," "Domestic Medical Practice," "Health and Longevity" purport to take the place of the physician in enabling the purchasers to make their own diagnoses and treating themselves. Some of the volumes contain 1,500 pages and are a half foot thick, but contain material, in some instances at least, written some thirty years ago. While some of the volumes contain articles written by men of standing, the articles have been revamped for use in such volumes purporting to give free medical treatment.

This particular "Library of Health" seems to be a rehash of a similar volume which appeared some years ago under the title "Medicology or Home Encyclopedia of Health." It gives its readers to understand that diphtheria and scarlet fever may be due to exposure to sewer gas, advises leeches for cancer, etc.

The volume is sold on an initial payment of \$5 and the balance of \$23.50 on the installment plan.

That such a volume at such a price is a poor substitute for the services of a physician is obvious.

OF GENERAL INTEREST

Dr. W. C. Stillwell, formerly of Mankato, is now located at Santa Ana, California.

Dr. William H. Smith, formerly of Cass Lake, is now located at Cold Spring, Minnesota.

Dr. Arthur H. Pedersen of St. Paul has returned from Vienna, where he spent two months in study at the various clinics.

Dr. and Mrs. Harry C. Jensen have returned to their home at 3845 Park avenue, after an absence of four months.

The Southwestern Minnesota Medical Society will hold its next meeting at Lakefield, Minnesota, on Thursday, October 29, 1925.

Dr. Marshall S. Underhill changed his location from the Mayo Clinic, Rochester, to Evanston, Illinois, where he is practicing his profession.

Dr. E. T. Merrill, who has been with the Mayo Clinic at Rochester, Minn., is now associated with the Rochester General Hospital of Rochester, New York.

Dr. H. A. Beaudoux, formerly of Minneapolis, has opened offices for the practice of his specialty in eye, ear, nose and throat diseases at Oakland, California.

Dr. A. C. Strachauer, director of the Memorial Cancer Institute, University of Minnesota, has gone East to visit the cancer hospitals of New York, Boston, Buffalo and Baltimore.

Dr. F. P. Frisch, formerly of Richmond, is now associated with the Quain and Ramstad Clinic at Bismarck, North Dakota, where he is specializing in eye, ear, nose and throat work.

The new cottage for women at the St. Peter State Hospital was opened on August 21. The capacity of the new building is 75 patients. The institution now has a population of over 1,500.

The Minnesota State Medical Association has moved its headquarters and office of its secretary to 11 West Summit Avenue, St. Paul, the new home of the Minnesota Public Health Association.

At the annual meeting of the American Roentgen Ray Society, held in Washington, D. C., September 22-25, Dr. Russell D. Carman of the Mayo Clinic, Rochester, was chosen president-elect for the coming year.

The marriage of Dr. William A. Kennedy of Minneapolis and Miss Helen Marie Dore of St. Paul was solemnized at St. Luke's Catholic church, St. Paul, Wednesday morning, October 7, 1925. Dr. and Mrs. Kennedy will make their home in St. Paul.

Dr. S. A. Slater has leave of absence from his duties as Superintendent of the Southwestern Sanatorium at Worthington, and is spending his vacation in New York state. He expects to return to Worthington about the first of the year. Dr. Otis Britt is managing the Sanatorium in the absence of Dr. Slater.

Dr. Leo G. Rigler has become associated with the Minneapolis Clinical Association as director of the departments of X-ray Diagnosis and Radiotherapy at 701 La Salle Building. Dr. Rigler is Director of the Roentgenology Department of the Minneapolis General Hospital and will continue in that capacity.

Announcement has been received of the marriage of Dr. H. E. Wilmot of Litchfield and Miss Dorothy N. Frisch, daughter of Senator and Mrs. John Frisch of St. Charles, Minn., September 12, 1925. Dr. and Mrs. Wilmot are now at home in Litchfield, where Dr. Wilmot has been practicing for the past year.

The Board of Directors of the Hennepin County Public Health Association has unanimously invited Dr. Richard Olding Beard, who recently retired from active teaching service at the University, to take the Field Secretaryship of the Association upon a part-time basis.

Dr. Beard has accepted the appointment, with the understanding that he will continue to devote a major part of his time to the direction of the Committee on Endowment and Building Funds of the Medical School of the University. He is Chairman and General Secretary of this Committee and has been initially responsible for the promotion of its work since its appointment.

Dr. Horace D. Arnold of Boston, President of the National Board of Medical Examiners, has announced that two additional states, Connecticut and Utah, have notified the Board that henceforth they will accept its certificate qualifying physicians to practice medicine in those states. The Board has been active since 1915 in establishing a standard qualifying examination of such character that its certificate can be accepted by all State Boards licensing physicians. Its certificate is now recognized in more than 30 states, and also in Great Britain.

At the last conference of the State Health Officers with the Surgeon General at Washington, D. C., they proposed and unanimously adopted a resolution, asking that the Surgeon General take steps to create a registration area for morbidity reports comparable to the registration areas of the Census Bureau for births and deaths.

The number of insane and feeble-minded, many of whom are in this condition as a result of preventable diseases, is constantly increasing and adding to the burdens of the taxpayer.

During the calendar year 1922, the last for which data are available, there were 78,070 persons cared for in almshouses and 348,928 in homes, day nurseries and similar institutions. In addition to these, there were in hospitals and other institutions for the care of the insane and feeble-minded and epileptics a total of 343,174 persons. Records show that more than 400,000 persons go out from our State and Federal penitentiaries annually; many of those of our dependent classes as well as many of those in penal institutions are suffering from preventable diseases which in some measure are factors in their dependency or delinquency.

It is of the utmost importance that provision be made for the better collection of morbidity statistics, including those diseases which play such an important part in the production of insanity and feeble-mindedness.

MEDICAL LIBRARY ASSOCIATION AND HIGH COST OF GERMAN
MEDICAL PUBLICATIONS

At the annual meeting of the Medical Library Association held in Atlantic City in May, one of the most important subjects under discussion was the present attitude of the German medical publishers in the high prices charged foreign subscribers for their medical publications and the greatly increased output of their periodicals.

In compliance with the action taken, the Executive Committee is now making an investigation of this matter. As a result of its findings, it is to decide whether or not concerted action on the part of medical libraries of America will cause the German publishers to curtail their output and reduce the cost of their publications to their American customers.

A number of the libraries in the Association have donated freely of their duplicates and other organizations have provided subscriptions for American medical publications to aid German libraries and physicians in replenishing their depleted files and in acquiring current literature. It appears from the action of the German medical publishers toward American purchasers of their publications that this evidence of good-will and co-operation on our part has been and is little appreciated.

All individual subscribers and purchasers of German medical publications are asked to lend their endorsement to the effort now being made by the libraries. Those willing to join in the movement in order to bring about united action on the part of both libraries and individual subscribers are requested to communicate with Miss Margaret Brinton, Librarian, Mayo Clinic, Rochester, Minnesota.

UNIVERSITY NEWS

The President and the Board of Regents of the University of Minnesota announce the completion of the Cancer Institute and the Todd Memorial Hospital, units of the University Hospitals. They will be open for the reception of patients shortly.

The Cancer Institute was financed through the generous gift of two hundred and fifty thousand dollars to the University of Minnesota by the Citizens Aid Society of Minneapolis, of which Mrs. George Chase Christian is the president, and is a memorial to the late George Chase Christian. Fifty thousand of the amount contributed by the Citizens Aid Society was given to cover the cost of technical equipment, including radium. The Howard Baker Fund, a gift of forty thousand dollars to the University of Minnesota by the Late Howard Baker of Minneapolis, which was originally accepted by the Board of Regents for use in the Department of Surgery of the Medical School, has been set aside by the Board of Regents for the exclusive use of the Cancer Institute, and some of the income thereof has already been used in the purchase of radium.

Mrs. Frank C. Todd, Mrs. E. C. Gale and Mrs. Emory Mapes were liberal contributors to the fund provided for the erection of the Todd Memorial unit, an eye, ear, nose and throat hospital, the balance of the required sum having been provided by the Board of Regents of the University from University resources.

The completion of these units, which are housed in one building joining the Elliot Memorial building on the east, brings the total capacity of the University Hospitals to three hundred beds.

Among the special features of the building may be mentioned the x-ray and radium laboratories and the Cancer Outpatient Department with its examining and treatment rooms and offices on the ground floor of the building; a two-story amphitheatre type lecture room having a seating capacity of 154, located in the north section of the building; the Frank C. Todd Memorial Room for the use of the Ophthalmology and Oto-Laryngology staff, located on the fifth floor; and large open porches with southern exposure on each of three floors for the use of the patients.

The terms of acceptance, by the Board of Regents of the University of Minnesota, of the gift from the Citizens Aid Society for the erection and equipment of the Cancer Institute specifically provide for the admission and care of patients who are financially able to pay for care and treatment furnished to them. This class of patients is eligible for admission whether resident in the State of Minnesota or elsewhere.

The University Hospital offers three services to which patients may be admitted, depending upon their economic status, as follows:

1. A Free Service, which is open to residents of Minnesota only, to which applicants must be certified as eligible for admission by a member of the Board of County Commissioners of the county in which the patient resides, under the provisions of Chapter 411, Session Laws of 1921, as amended by Chapter 265, Session Laws of 1923.

2. A Pay Service open to those who are able to bear the cost of hospital service, at minimal rates only, and who cannot pay charges for professional services. Admission to this service may be secured upon the application therefor made by the patient's local or family physician.

3. A Pay Service which, within the limitations of the necessarily small number of beds available for the purpose, is open to those who are able to pay both a hospital charge, covering such accommodations as they may choose, and charges for any professional services which they may require. Admission to this service may be secured through reference by the patient's local or family physician or by direct application to the Superintendent of the University Hospitals. Patients are admitted to this service irrespective of their place of residence.

DR. HILDING BERGLUND

The profession throughout Minnesota and particularly Minnesota Medical School graduates have a very live interest in the medical school. The demands of private practice have necessitated the resignation of Dr. S. Marx White as Chief of the Department of Medicine. Fortunately, Dr. White retains his connection with the school as professor of medicine and will continue to conduct clinics and share in the work of the Committee on Endowment and Building Funds.

Dr. Hilding Berglund has been appointed Professor of Medicine and Chief of the Department of Medicine. Born in Sweden thirty-eight years ago, he assumes his new responsibilities at a comparatively young age. He received his M.D.

at Stockholm in 1916 and after working for some time in the Stockholm Clinic came to Boston in 1920, where he has been working in Biochemistry with Professor Otto Folin at Harvard. After two years at Harvard he became associated at the Peter Bent Brigham Hospital in Boston, continuing research in problems of medicine, using clinical material of the hospital and the facilities of Dr. Folin's laboratory for biochemical study. At the same time he carried on work at the Boston Dispensary. Two years ago he returned to Sweden to qualify for the Docentship, a necessary step towards professorship in that country. He now holds the rank of Assistant Professor of Medicine at Harvard.

His work has acquired for him a national reputation and has been principally upon the following subjects: (1) The relationship between uric acid and gout; (2) uric acid problems, experimental study on animals and man, including gouty subjects; (3) cystinuria; (4) some new observations and interpretations with reference to transportation, retention, excretion of carbohydrates; (5) a colorimetric method for the determination of sugars in normal human urine; (6) a study of chemical and physical characteristics of albumin in albuminuria, etc.

Dr. Berglund comes to us highly recommended by his associates. He is recognized as a man of ability with considerable possibilities in research work. He has had clinical experience and a thorough grounding in fundamentals of medicine, both of which are so necessary for an essentially laboratory man. We wish him the best of success in his new field of endeavor.

Resignations of Dr. J. Frank Corbett and Dr. Arch E. Wilcox from the A service of the Minneapolis General Hospital were accepted. Dr. Zierold's appointment to the service was approved.

The following appointments were recommended: Dr. Michael G. Mulinos as Assistant in Pediatrics; Dr. George Geist as Assistant in Surgery; Dr. Benjamin I. Derauf as Assistant in Obstetrics and Gynecology; Dr. P. M. Mattill as Assistant in Medicine.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of September 9, 1925

THE PRESIDENT'S ADDRESS

DR. HARRY P. RITCHIE
St. Paul

In relinquishing the President's emblem to the hands of Dr. Henry Ulrich, I thus formally conclude, to me, a profitable and honorable tour of duty as the thirty-ninth president of the Minnesota Academy of Medicine. The gavel, a gift of the late Dr. Frank Todd, is materially new but on its silver face are inscribed the names of all the past officers, with the years of their service, and thus rep-

resents the entire history of the organization. One would be densely dull to all sentiment, to all emotion, not to feel an intense pride at having one's name lawfully placed in the sequence with these splendid men. Space is still left for those to follow, a space to be closed in fifteen years. Thus, this instrument of authority carries over from the past, through the present, into the future. Although thirty-eight years, when closely analyzed in word and deed, is a long time, yet, when we visualize all the years to come for these progressive communities of St. Paul and Minneapolis, the great Northwest of magnificent resources placed in the latitude of the earth most conducive to sustained activity, when we look at the splendid University, and the medical school building and builded upon firm foundations, when we count the many youths to enter through its doors and out again, with the diploma of our profession, when we remember the old world societies, and universities, the years of their history running into centuries, when we think of all the unsolved problems of our work, then we can readily say that thirty-eight years is but a beginning and that the members, past and present, are but pioneers.

In its original conception, the Academy brought together men of St. Paul and Minneapolis, at the time of organization far apart. Space and distance are now largely eliminated so that now, although politically separate, geographically these cities are one. Professionally our interests, desires, intentions and efforts are identical. The sphere of contact has broadened and the proceedings now include splendid contribution from the enthusiastic members from Duluth, Warren, Rochester and Eveleth. The record of the Academy is now such that it may assume, if it is not already recognized, the right of the Senior Society of the State. It is no longer a local affair, its influence and purpose no longer for the benefit and progress limited to its own members. Because herein are included men of authority, men of experience in actual practice, able and competent to weigh merit in all branches of medicine, whether fundamental or practical, the opinions here expressed upon that merit and value of methods for the curing of the sick and the relief of suffering are almost final. These opinions should be so placed as to be accessible to every one—and the Academy thus assumes a greater and wider responsibility.

In this organization I find the best plan for progress. Here is a group of men of mature judgment, meeting each other on common ground, representing all branches of medicine, selected as qualified by active practice and wide experience, old enough to be imbued with the sense of the great responsibility of our profession, intensely earnest in the scientific prevention, cure and alleviation of disease and suffering, jealous of the good name of Doctor, and a group which, to my mind, is the culmination of all the complicated machinery of medical education, for whom all research is undertaken and accomplished, for whom all scientific efforts are made: the active practitioner, the man who carries the goods to the patient and practices in the laboratory of humanity.

The word "record" means to preserve in writing, to chronicle, to register. The minutes of the past proceedings are now filed at the State Historical Society. The minutes of

the present are now recorded more carefully and fully than ever before.

The word "tradition" is defined as the delivery or handing down of opinions, doctrines, rites, customs from father to son or from ancestors to posterity by oral communications without written memorial. Tradition is that interesting, indefinite and undetermined field: the influence of one upon the other, seniors upon the juniors, by example in conduct, deportment, interest and effort, by personal contact and intimate advice, the spoken word of unrecorded discussion.

Tradition of the Academy is in the making. In such a small group it is the accomplishments of individuals that contribute to the making of that tradition.

That we are still young as an organization is shown by the fact that charter members are with us, and others old enough in experience and service to be so classified are in constant attendance, contribute to its transactions, influencing us all by their enthusiasm, and proving that, no matter what the years may be, the problems of medicine and surgery are inexhaustible in their interest. It is one of the great privileges and privileges of membership that we meet with them and profit by their advice and example.

During the thirty-seven years of the life of the Academy, there are men who were closely associated with its activities who have completed their life work. They are the ones to whom we may speak. What did they accomplish? Whom did they influence? What were their standards? What did they contribute to the tradition of the Academy?

That I should select those with whom I was in close contact is but natural. What can be said of them might be said in many degrees of others, but of these I can speak more intimately.

FOUR MEN OF THE ACADEMY

Archibald MacLaren was the nineteenth president of the Academy. He lived sixty-six years, dying at his home in St. Paul, October 12, 1924. He was born in Red Wing,

Minnesota, coming with his parents, at an early age, to St. Paul, where a part of his boyhood was spent at historic Fort Snelling.

The record in the Civil War of his distinguished father, Major Robert MacLaren, was a matter of family pride and general recognition. His mother was one of the most lovable, wise and remarkable of characters. From her he received the wonderful traits of gentle manner, courtesy and kindly consideration, so pronounced

loyalty given not only to his home, but to his friends, his associates, his church and his country. Wherever he decided to lend himself no medium effort, but entire support was his.

Dr. MacLaren graduated from Princeton in 1880. The College of Physicians and Surgeons gave him the degree of medicine in 1883 and he interned at the Women's Hospital of New York.

These three institutions gave him the foundation for a career which in the early eighties was exceptional in the Northwest.

No attitude of superiority was ever suggested by his manner, but his judgment, experience and results were soon so broadly recognized that he readily attained a clientele which might easily have unbalanced a less steady personality. Influenced by his work at the Women's Hospital, to whose illustrious staff he constantly referred, he was first interested in gynecology. But the inviting problems of other fields led him to broaden his endeavors to care for the conditions well known today, but in the nineties still debatable, which required courage and decision to attack.

Without further remark, it can truthfully be said that the result of his labors is a splendid record of accomplishments in nearly every field of surgery.

In all societies he received recognition and preferment; in the Ramsey County Medical Society, the Minnesota Academy of Medicine, the State Medical Association, of which he was president at the time of his death. Of his special societies he had his greatest enjoyment and profit in the American Surgical Society, always attended its meetings and was each year a contributor to its transactions. At various times he was recorder and vice president.

Early in his career Dr. MacLaren became associated with the University of Minnesota Medical School. He kept up an unflagging interest in this institution and gave his support up to the very day of his retirement. His Thursday clinics at St. Luke's Hospital were maintained over a period of nearly twenty years, at a time in the development of the medical school when such instruction rested upon the individual and his private patients always received constant effort, thought and preparation.

Dr. Charles Lyman Greene, writing a formal memoir of him in this respect, says: "A host of men can testify to the profound impression given, not by any showy demonstration but by imparting to them simply something of his own knowledge, his remarkable and discriminating conservatism, his enthusiasm, his high ideals and the fine ethical standards which were a part of him."

He made many contributions on various subjects, but that in which he most firmly believed and rigorously supported was the limitations of surgery in the asthenic. As his reputation broadened, his office became a clearing house for cases operated upon for chronic appendicitis and unrelieved of symptoms. Early x-ray studies showed so many of these patients had ptosis of all the abdominal organs. His writings, with Dr. Daugherty's, received wide attention. Brady, the newspaper writer, reviewed his contribution



Dr. MacLaren

and evident to all who knew him.

From his father could be traced a firmness of decision, an honesty of purpose and an inbred sense of loyalty: a

under the popular title: "Where Is My Wandering Stomach Tonight?"

When his field of endeavor widened, cases of abdominal inflammation other than female pelvic conditions came to his care. His experience in vaginal drainage led him to undertake rectal drainage for pelvic accumulations in men and the very young. His articles were severely criticized. But his continued support has resulted in the saving of many lives and is a distinct contribution.

He unconsciously developed a unique reputation by his ever readiness to admit, discuss and report his errors. His article on "Mistakes in Surgery," read and printed against stormy pressure, was widely discussed.

He was not only honest with his patients, but honest with himself, believing that by frank consideration of errors and mistakes progress could be best accomplished.

Dr. MacLaren had many qualities and abilities that men admire. He was a champion oarsman, an expert yachtsman, a curler of wide recognition, an ardent golfer, an expert billiardist. He was a sportsman with an exceptional knowledge of firearms, the habit of birds, the work of dogs. It was quite characteristic that he seldom remarked about the bag. With him the game had every chance.

The basis of this splendid life is that at heart and in all his instincts he was a kindly Christian gentleman, kind and considerate in all his dealings with whomever he came in contact, irrespective of station or degree.

The picture here printed was taken after he began to tire, but is selected because it shows this expression of kindly interest, tender, if such a word can be used of so vigorous a personality. But in all the twenty-five years of our close association and daily contact, it is the one most becoming and the one I will longest remember.

Warren Arthur Dennis was the thirty-fourth president of the Academy. He lived over fifty-three years, being cut down in the prime of life by pneumonia. We were classmates, we roomed together in St. Luke's and the City and County Hospital during our internships. There were very few subsequent years in which we did not make some trip together, attending medical meetings and clinics. Our acquaintance began the first day of our medical student life. He entered as an assistant to Dr. Hennricks, in Anatomy, while I went with Dr. Beard, in Physiology. In the old Millard Hall, these two laboratories connected by a door in the rear, and frequent were our consultations upon his work and upon mine.

Warren Dennis was soon placed as the most prominent member of our class. He was somewhat older, because,

after graduating from the University of Wisconsin, he taught school in order to obtain funds to carry him through medicine. He had an intense desire for knowledge and was trained to study. He was experienced in the expression of his thoughts, his judgment more mature. He more fully appreciated the curriculum, always acknowledged the efforts of his teachers, always stimulating them by earnest endeavor. He had time to be interested and helpful in the affairs of others, maintaining at all times a model deportment and conduct; no wonder he immediately attained a position of esteem and respect by his classmates, to be held in after years by all who knew him.

Looking backward, it seems remarkable to me how little professional contact we had. Very few cases ever saw us together. But our discussions upon our work were many, and I know this, that he gave more to me than I ever gave him, because he had a most orderly and logical mind and his conclusions upon any set of evidence were most correct.

He interested himself in the affairs of the profession, and wherever he associated himself recognition was given. He was at various periods President of the Ramsey County, the Minnesota Academy of Medicine, District Counselor of the Minnesota Medical Society, Secretary of the Western Surgical Society.

He held a commanding position in the wars: Major Surgeon of the 15th Minnesota in the Spanish-American War and Surgeon and Lieutenant Colonel of the 88th Base Hospital in the World War, and so served in France. Such were his great responsibilities, both of family and profession, that in participation in the recent war extraordinary sacrifices were made, but by so acting he aligned himself with many others, who, by their sense of duty and loyalty, voluntarily contributed their great service.

He was never robust physically. His lack of resistance was well known to his friends. His intense interest in his work led many times to great physical exhaustion and it was under such circumstances that he contracted his last illness.

Below the respect for his character, his personal charm of manner and his sterling worth as a surgeon, I had the deepest admiration of him because his life and accomplishments was a story of unassisted effort. At an early age he lost both father and mother. He was cared for by relatives, to whom during all the succeeding years he made every remembrance. Such a story must be a great stimulus to all those students who have their greatest resource in the hope and desire to work in this great field of medicine.

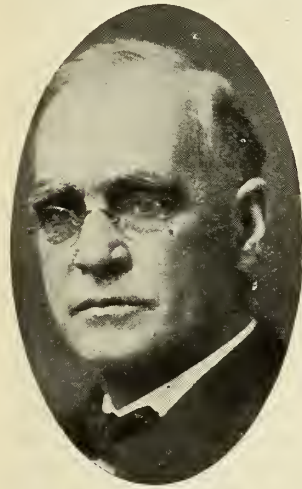
His literary contributions were not many. He always said he was not ready, but his power and clarity of discussion led him to contribute often spontaneously. His presidential address to this society on "Social Insurance" was a valuable paper.

Of Warren Dennis we can truthfully say that to the abilities which made him a splendid surgeon were added the judicial qualities of mind which marked him not only a wise adviser but a true counselor and friend.



Dr. Dennis

James Edward Moore was the twenty-second president of the Academy. He lived sixty-six years. Dr. Arthur Law, in the *Journal of Surgery, Gynecology and Obstetrics*, of December, 1924, presented a splendid memoir of his life and accomplishments.



Dr. Moore

I first knew him on the opening of the University Hospital. From then on our contact was almost daily, as it was with each member of the staff up to the time of his death. I came to have a profound respect for him and consider him a real master of surgery.

He had very high ideals and was so dextrous himself in actual work that he expected every one associated with him to be equally so. This applied

to every one and he freely expressed himself in criticism of any mediocre work. On two occasions I handed in my resignation from the staff because I thought my pride and standing had been seriously affected by his severe remarks. The only trouble was, that he was right and I was wrong on the cases.

It was his intense desire for good work, nice technic, complete diagnosis and his wide knowledge of surgery that many times caused expressions which could easily have been misinterpreted. He also had a manner suggesting a trait of vanity, a manner inviting the good word and compliment. But I soon found that this was only that sense of exhilaration which comes from a duty successfully accomplished. His work never became a routine, it was always an adventure, a problem to be solved, expertly and delicately to be done. He had the lightest and most gentle touch. I do not believe he ever intentionally hurt a patient in all his life. His manner was soothing and supportive. He carried confidence and decision into the sickroom, the wards and the operating room.

Dr. Law says, in his memoir, that he was a born teacher. I know he was. He had a fine command of English and in his quiet way he had a rare way of holding close attention.

I remember hearing Dean Ritchie remark, in response to the complaint of lack of material by some clinicians as an excuse for failure to meet their classes: "There's Moore, all he needs is a bone and he will give a clinic." This was true, and the drier the bone the more effort he made to give something worth while.

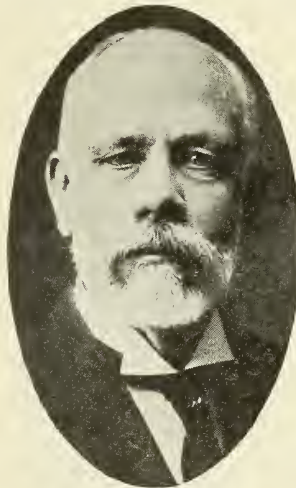
He wrote a great deal, was a constant attendant of meetings, always contributing, if not in formal papers, by terse and logical discussion. One of the prominent surgeons of the country and one of the younger men made individually this significant remark to me: "Dr. Moore's papers upon any subject are always complete and up to date." This latter expression is true of him, too. He never lagged; he

was always stimulating to those about him and supporting in his advice and interest in any worthy effort.

He had a great influence in the development of the medical school, lending himself not only to his own department but to the general questions of progress. He was as much a full-time man in his efforts and attention to duty as though he had been formally so designated.

My acquaintance with him is almost entirely limited to the years of our association at the University Hospital, but here on this field of actual work I can say that in Dr. J. E. Moore we have the highest development of surgical progress and he was in fact as his title read—a Chief in Surgery.

Parks Ritchie was the third president of the Academy. He lived sixty-seven years. He was born in the modest home of a minister of the gospel, brought up in an atmosphere of optimism and faith, surrounded by only the bare necessities of life and comfort made possible by the meager resources of his parents.



Dr. Ritchie

But though lacking in physical accessories, these parents breathed into him, by example and conduct, the spirit of service. They were always giving, not of material things, but of their mentality, their interest, their help, not only to friends, but to all who were in need in their community.

The father was a minister whose whole text of life was faith, hope and charity, who, by his constant reiteration of the text by preachment and practice became a most beloved man, known far and wide as Father Ritchie. A man, mild spoken, of manner gentle, of thought kindly, retiring and modest, who, during all his eighty-seven years, viewed the events of this life through glasses of rose and left it with a profound belief that the promises of his Bible would be fulfilled.

The mother was a strong, vigorous woman of positive opinions, aggressive in her desires and intentions, active of motion, a doer of things, with a keen mind and intellect. She was for years a school teacher who believed that the rod was an efficient instrument of education. She was an active worker in the church, an original fundamentalist, rigorous in her belief and requiring all others to meet her half-way. A desire for knowledge carried over to her declining years, and her interests in reading and lectures kept with her to the end.

She was ambitious and it was she, I have no doubt, who named her first-born Elijah Parks, believing and hoping that he would also soar away to the great things of this life and the future. A rather stern manner and demeanor merely cloaked a fountain of humor, keen and nimble wit, a quality which beloved her to all who knew her. Aunt Hannah Ritchie was a forceful character.

Parks Ritchie had many of the qualities of his parents, not only in his personal life but in his contact with his patients. Whether he ever approximated the dreams of his mother and his name Elijah, I am sure that many will agree that he went far in that direction.

As a student he attended the Cincinnati College, where, after two terms of seven months each, he received his diploma. Such a foundation in the light of our present elaborate machinery was very meager.

After practicing in a small town in Indiana he moved for a short time to the plains of southern Kansas, a period which made a great impression upon him. The incidents of that experience were the source of many a story.

After coming to St. Paul in 1880 he associated himself with the late Dr. Alexander J. Stone. Through him and his acquaintance with others prominent in the city profession, he became a part of that group forming the St. Paul Medical College. I remember very well his excitement and enthusiasm over the prospect, and as a boy observed his preparation for his part in the work. I heard his opinion on the amalgamation of the colleges of these two cities to form the University of Minnesota Medical School. When the time came for election as Dean of that school, to follow Dr. Millard, it was with much thought and consideration and full appreciation of the responsibility of the position that he entered upon that work.

The years of his tenure brought many problems. One of these was the continual warfare between the clinical and laboratory branches for preferment in development. These were the days of the development of the laboratories and it was his appreciation of their great need that won his support in the hope that, when they were properly housed and the courses well manned, the clinical side would then be developed, and personal and gratuitous services in the field of clinical medicine and surgery would be dispensed with.

Another question that gave him great thought was the ever-increasing demand for a high standard of entrance. Remembering his own beginning, he had every sympathy with those who for various reasons were lacking. He had a wonderful manner of attention and suggestion and helpfulness in these matters. It is no uncommon happening for someone now practicing to tell me of how he helped them over some barrier. He got a great joy out of these incidents because often he expressed a fear that this continued elevation of requirement would keep from the profession many estimable men. "If it had not been for your father," is a frequent expression that I hear.

His lectures were always well attended, always interesting, not highly technical, but made valuable by much homely advice. They must have contained something because in the years since his death it is a frequent occurrence to have someone refer to them. His stories were always illustrative.

A number of years of association with Dr. Justus Ohage proved a happy time of his professional life. Two men of such diverse origin, training and attainments, they met on a common ground of cheerfulness, humor and optimism.

He often compared the act of parturition of the animal and the human in order to point out how horrible, how

fearful a physiological process it is, devoid of all those things we conceive as beautiful, and in such the human is no better than the lower animal. But when we surround, as we do, the birth, with all the mother love, the pride of the father, the ceremony and joy, the pink ribbons and blue pins, then this process becomes the greatest event in life. Our own ability to appreciate, in its fullness, the beauty, the care and fostering of our young is that which elevates the human race above all others.

He was a general practitioner. He went into the home of the patient. He went when he was called, and he rendered service and gave advice, more than was necessary. He carried cheer and reassurance wherever he went. Often he did this by some quick response or side remark, some odd interpretation of a situation. One of the prominent bankers in St. Paul told me that one night he thought he had swallowed the wrong medicine. In terror he called my father, who responded immediately, heard his hurried story, carefully examined him, the bottle, the whole situation, solemnly and completely, and turned to the patient and said: "Well, Jim, if you had any moths inside of you, they are now all exterminated." The very abruptness, the absurdity of the remark brought quick relief and was better and more potent medicine than any other, because it was his quick intuition that here was a case of mental rather than physical distress.

His intuition, his quick wit, was a heritage from his mother, and it was through her that he carried in his bag other things than his medicine. How much he contributed to purely scientific progress is questionable; how much impression he made in the development of the medical school is unknown, but as an individual meeting other individuals, his influence was great, not only on his students, his friends and associates, but upon a host of people who sought his service. In this present time of more routine, standardized, impersonal study of disease and care of the patient, it is well to remember that many times that personal care and attention is invaluable. His kindly consideration, his unselfish services, his wit and humor carried him far, to many friends and to unusual respect in the profession.

Of heritage of material things, one must be always grateful, but that which transcends all others is the good name of one's father.

These four men contributed to the tradition of the Academy. Working in different fields they met here together. They all worked up to the day of their death, two of them cut down suddenly, two after a short time of retirement. They kept their interest to the last, they lived in the future. They kept their spirit and urge and love until no longer able to physically perform their duties. All were enthused with the sense of great service, all loved their work in its fullness, with a deep honesty of purpose. They were examples for others to emulate. They were models for us all to follow in our contribution to the tradition of the Academy, in the hope that we may also augment the progress of the great profession of medicine and earn the reward which we all agree they did earn, a reward greater than all others, the satisfaction of accomplishment, the love of one's family, the respect and esteem of one's fellows. They were worthy of their hire.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

A CASE OF BILATERAL NEPHROLITHIASIS*

OSCAR OWRE, M.D.

Minneapolis

L. F.—A man, aged 34 years, white. The patient entered the hospital December 11, 1923, complaining of attacks of pain in the lumbar region below the costal margin on both right and left sides. He stated that the pain radiated downward into the groin, the legs, and the scrotum. It was very severe and very sharp and lasted from an hour to several days. When severe attacks had subsided there was constant dull aching in the kidney region. The pain was more severe on the right than the left side. There was no hematuria with the attacks, al-

though frequency and nocturia were present. Since then he had been free from pain until the present illness, although frequently, urgency, and nocturia were present. The patient had had measles when a child, and influenza in 1918, but no operations or injuries. The family history was negative. He had been married fourteen years, had four children, living and well, and his wife had had no miscarriages or stillbirths.

He had become infected with gonorrhea the summer previous to entering the hospital, was treated for nine weeks and apparently cured. He denied syphilis.

The patient was a small man, very well developed and fairly well nourished. He had lost fifteen pounds during the last six months. Examination of the head, neck, chest, cardiac system, and gastro-intestinal tract was negative. There was no nausea or emesis, and the appetite was good. He had had many colds, but no cough, hemoptysis, or night sweats. There was no nervous or mental disturbance. The abdomen was tender and slight muscle spasm was noted over both recti. There were no masses palpable.

The genitalia were negative. Murphy percussion was positive on both sides. Bimanual palpation on the left

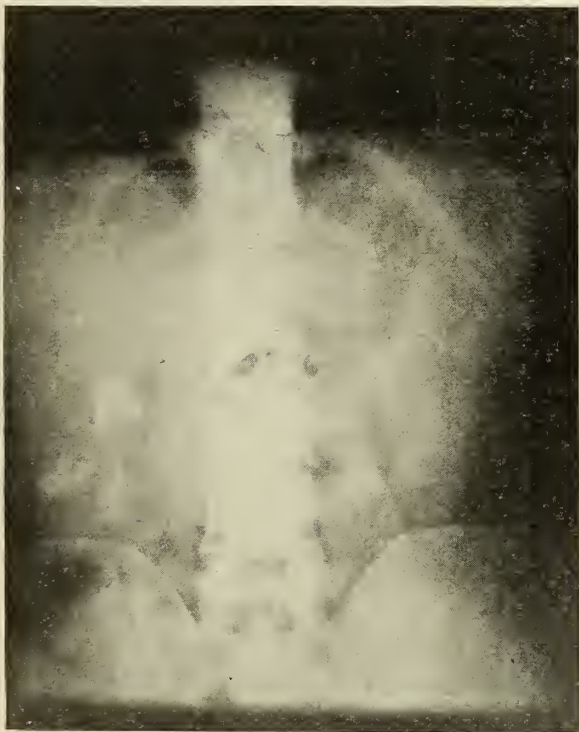


Fig. 1. Roentgenogram showing bilateral nephrolithiasis.

though frequency and nocturia were present. There was no nausea or emesis.

The patient gave a history of similar attacks fifteen years ago, accompanied with severe hematuria. At that time he was treated by a doctor. The pain was relieved and the hematuria stopped. One year later he had another

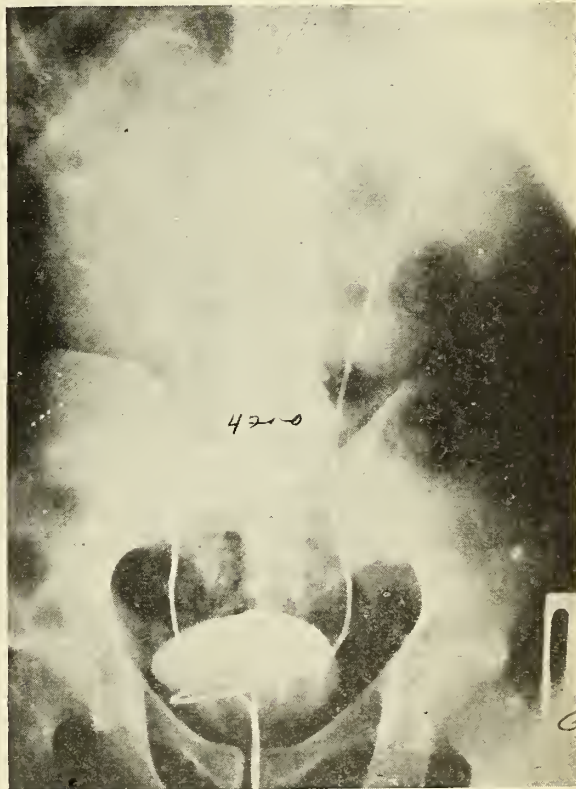


Fig. 2. Ureteral obstruction due to calculus at pelvis of kidney.

side did not reveal kidney or spleen, but on the right side there was a suggestion of a large kidney. Owing to the fact that the patient could not relax his abdomen, this finding was not absolute.

Laboratory findings: The urine contained many pus cells on three occasions, and was persistently acid. The

*From the Division of Genito-urinary Surgery, Minneapolis General Hospital.

blood findings were normal, Wassermann reaction was negative, and urethral smears were negative.

The roentgenological report was as follows: The right kidney was massive, extending from the eleventh dorsal vertebra down to the fifth lumbar. The left kidney was not well visualized, but appeared to be ptosed, so that it lay chiefly at the level of the third and fourth lumbar vertebrae. On the right side there were two large calculi and three smaller ones, all located in the lower portion of the kidney, probably corresponding to the pelvis. One large irregular calculus was noted in the pelvis on the left side. The bladder was thickened but contained no calculi.

Impressions: Nephrolithiasis—bilateral; hydronephrosis—right.

Cystoscopic examination: Cystoscopy was done in the usual manner. The bladder was evacuated of foul smelling, cloudy urine, and irrigated with several quarts of fluid, but owing to the extensive cystitis catheterization of the ureters was impossible. It was deemed advisable to irrigate the bladder daily for about one week. A cystoscopic examination was done a week later under caudal anesthesia. The urine was still cloudy and foul, with marked evidence of cystitis still present. The ureters were catheterized and cultures and specimens obtained. On the left a culture of bacillus coli was found, with many pus cells; on the right a culture of bacillus coli was present and the specimen was packed with pus cells. An intravenous injection of 1 c.c. of phenolsulphonephthalein was given and specimens collected from each kidney in a 2 c.c. solution of 10 per cent sodium hydroxide. The discoloration of the fluid occurred in two minutes on the right and seven minutes on the left.

January 3, pyelotomy and nephrotomy were done under gas-ether anesthesia. Incision was made on the right, beginning from the twelfth rib posteriorly to and opposite the superior spine of the ilium anteriorly. The tissues were separated, exposing Petit's triangle. The peritoneum was then exposed and reflected. The adipose kidney capsule was opened and the kidney exposed. Adhesions, which bound the upper pole securely, were freed by both sharp and blunt dissection. The stones could then be palpated in the pelvis and lower pole of the kidney. The kidney was then delivered and found to be markedly enlarged, the upper pole having a very soft consistency, suggesting a fluid content. Incision was made in the pelvis and a large, hard stone, about 2 cm. in diameter, was removed. The lower pole was incised and a smaller stone, about 1 cm. in diameter, was removed. A third incision was made, in the upper pole, and a seropurulent fluid drained. A soft catheter was inserted through the incision and into the ureter of the kidney and sutured in place. Closure was made in the pelvis and kidney tissue with fine catgut. The kidney was then replaced and a cigarette drain inserted into the peri-renal tissue. Closure was made with catgut, dermal, and three silkworm stay sutures.

The patient's postoperative recovery was uneventful. The drain was drawn out about an inch daily until removed. The drain into the kidney was removed on the fifth day. The wound looked fairly good and the stitches were removed on the tenth day. Closure was almost complete at that time.

February 20, 1924, the patient was again admitted to the hospital with severe attacks of renal colic on the left side. The pain radiated along the left groin and into the scrotum. Murphy percussion was positive. Frequency and urgency of miction were present with the attack. The right side was free from pain.

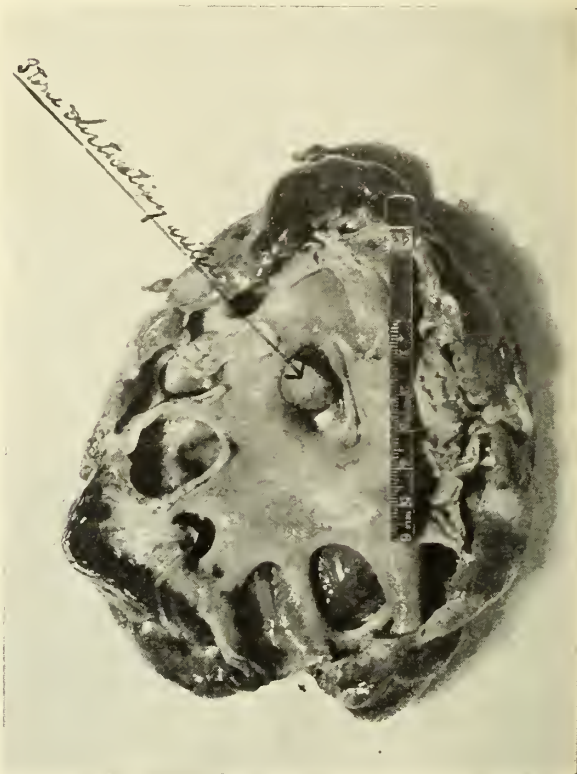


Fig. 3. Hydronephrosis with stone obstructing ureter.

Roentgenological examination showed enlargement of both kidneys, with one large stone in the pelvis of the left kidney. The right was free from stones.

A cystoscopic examination was made to determine the function of the kidneys. The bladder mucosa showed evidence of slight ulceration along the course of the left ureter and about the ureteral meatus. The spurts from the right ureter were rhythmic, while on the left they were delayed. The ureters were catheterized, the catheter meeting obstruction 22 cm. from the ureteral meatus. The right catheter passed directly into the pelvis. Specimens were obtained from both sides, the left being very cloudy, the right slightly cloudy. One cubic centimeter of phenolsulphonephthalein was injected intravenously and specimens were collected in 10 per cent sodium hydroxide. The dye appeared on the right side in three and one-half minutes, although it was not recovered on the left after forty minutes. Attempts to introduce sodium iodide into the left kidney pelvis were unsuccessful, the fluid passing back into the bladder. Pyelogram showed the catheter in contact with stone.

March 1, 1924, nephrectomy was done. Incision was made extending from the twelfth rib posteriorly on the left, to and opposite the superior spine of the ilium ante-

riorly. The muscle and fascia were severed, the fatty capsule exposed and opened into. The ilio-inguinal and ilio-hypogastric nerves were freed and the kidney delivered. The ureter was exposed, clamped, tied, and severed. The blood vessels were clamped and tied and the kidney was removed. Closure was made with three silkworm sutures, the muscles and fascia were approximated with catgut, and the skin with dermal. A large Penrose drain was inserted into the upper angle of the wound.

The postoperative care was similar to that described in the previous operation. Recovery was uneventful and the patient was discharged in twenty days.

Laboratory report: After the operation the urine contained few pus cells. Function: Total 28 per cent with intramuscular phenolsulphonaphthalein. *Bacillus coli* were present prior to nephrectomy but were absent on several examinations after the operation. Blood chemistry was normal before and after both operations.

April 4, 1924, the patient again came to the hospital. He had felt well for thirteen days after his discharge from the hospital. April 7 he developed severe pain in the right lumbar region, which radiated into the right lower quadrant. With the onset of the pain, emesis resulted. The patient was unable to retain either solid foods or liquids. Previous to this attack he had not vomited in the past twenty years.

Roentgenological examination was negative.

Laboratory report: April 4, the urine contained many pus cells. Leucocyte count was 12,800, polymorphonuclears 89 per cent. Blood chemistry: Creatinin 2.3 mg., urea 42.6 mg., glucose 116. Ten days later the urea dropped to 23.3 mg.

Treatment: Proctoclysis, liquid diet, forced elimination, and hexamethylenamin, together with sodium acid phosphate.

The patient left the hospital April 14, apparently much improved, with normal blood chemistry and urine negative.

In conclusion, we wish to state that in cases of double nephrolithiasis we operate on the best kidney first and get it in the best possible condition before directing our attention to the other. In this case, we intended to remove the large pyonephrotic kidney, but it was necessary to put the other in a safe condition and free from calculus.

The patient was seen two weeks ago and is in excellent health, being able to work eight to ten hours daily in his tailor shop.

ZINC STEARATE POISONING

The effects produced by the aspiration of zinc stearate consist in the production of an acute disturbance of the bronchi and lungs. The cases that have been reported can be divided into several types: (1) The fulminating variety composes one group, in which the onset is sudden and stormy, with rapid respiration and cyanosis. (2) In another group acute bronchial pneumonia develops. (3) In the third group of cases the course of the illness is brief. It has been shown experimentally that the inhalation of zinc stearate produces interstitial pneumonia and peribronchitis. Manufacturers should be prohibited from selling the powder in its present form: a self-closing container should be insisted on.

(*Jour. A. M. A., Sept. 12, 1925, p. 844.*)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

THE ORAL ADMINISTRATION OF SODIUM TETRAIODOPHENOLPHTHALEIN FOR CHOLECYSTOGRAPHY: Whitaker, L. R., Millikin, G., and Vogt, E. C. (*Surg., Gynec. and Obst.*, 1925, Vol. XI, pp. 847-851). It is claimed that sodium tetraiodophenolphthalein administered orally will produce satisfactory cholecystograms. The drug is administered in five grain salol-coated pills, enough to amount to a dose of 0.08 gram per kilogram of body weight. The pills are started in the evening following a light supper and are taken at 15-minute intervals with half glass of water. Roentgenograms are made 12 and 15 hours after taking the pills. After the 15-hour plate a meal is taken, and one hour later another roentgenogram is made. The purpose of this is to see if the gall-bladder shrinks during digestion.

Of 44 persons thus tested, 27 had no symptoms, 5 vomited, 5 had mild diarrhea, 7 had slight nausea. Cholecystograms were produced in 93 per cent of normal subjects.

This method relieves patients of the hospitalization necessary for the intravenous method, causes very little inconvenience and few unpleasant symptoms.

A normal clearly outlined shadow which diminishes rapidly in size during digestion, is taken to indicate little or no gall-bladder disease. An imperfect or total absence of shadow may be due to imperfect technique or gall-bladder disease. An intravenous injection of the drug will confirm the findings.

J. K. HOLLOWAY, M.D.

ACUTE INFECTIONS (special reference to pelvic infections): Infection is a disease in which there is a battle between the body and invading bacteria. Inflammation is an ally of the body. In pelvic infections no specific therapy of much importance has been found. Serum therapy even in puerperal infection is of little value.

The use of proteids, intravenous antiseptics, et cetera, is largely in the experimental stage. Their usefulness is undetermined, except that intravenous antiseptics such as mercurochrome seem of definite value in some cases of staphylococcus and colon bacillus infections. Supportive

treatment, as in tuberculosis, is important in infections. Outdoor treatment is of especial value. Surgery should be conservative. The treatment of puerperal infection has become almost non-surgical, and rightly so. The operation of incision and drainage of pelvic veins in acute puerperal phlebitis has died a well deserved natural death. In puerperal pelvic exudates there is often little or no suppuration. When abscesses are present they are usually multiple and often inaccessible. Such exudate nearly always disappears entirely by spontaneous absorption. Non-puerperal infections of the fallopian tubes has also become largely non-surgical. There is little need for surgery for acute infections of the tubes. Fifty per cent of all patients with infection of the fallopian tubes, if given good medical care and sufficient time, will recover without operation. Recovery does not mean complete restoration of function of the tubes; neither is function of such tubes restored by surgery. In pelvic abscess, unless it is large and superficial, it is better to postpone surgery until immunity is established.

The treatment of acute infections should be chiefly medical with few exceptions, as surgery is essentially concerned with tissue pathology and in these cases the condition of the tissues is of secondary importance.

J. K. HOLLOWAY, M.D.

PEDIATRICS

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ACRODYNIA: F. C. Rodda, M.D. (*Amer. Jour. of Diseases of Children*, August, 1925). The etiology of acrodynia is not yet clear. Whatever the cause may be, it surely is not due to a deficiency in diet. There is much proof, clinically, that acrodynia is the result of a chronic intoxication from upper respiratory infections. There appeared to be no sex distinction.

In 60 per cent of the cases, there was a definite time from the infection to the onset of the hyperirritability, that is, an incubation period of from one to two months. The duration of symptoms averaged from one to three months. In one case, it was six months and in another two years.

The first four symptoms—hyperirritability, hyperhidrosis, rubbing of hands and feet, the erythema and peculiar changes in the skin of hands and feet—were found in all cases. These symptoms are pathognomonic. Desquamation and generalized miliaria were found almost as frequently. Sleeplessness, anorexia, loss of weight and weakness, results to be anticipated from the preceding symptoms, were present in nearly all the cases. The neurologic findings, paresthesia and diminished reflexes, occurred in over half the cases. Alopecia occurred in nine, photophobia in eight and loss of teeth in three cases. The author has

never seen the condition in a child whose tonsils and adenoids had been removed.

In a few of the early patients, eventually the tonsils and adenoids were removed, not anticipating any effect on the disease, but simply to relieve the child of the handicap of a persisting upper respiratory infection. To the author's surprise the patients promptly recovered. There was speedy relief from perspiration, a return of appetite and sleep, a gain in weight, and lastly the disappearance of the peculiar skin findings. Since making these observations, the tonsils and adenoids have been removed as soon as a diagnosis was made. In this series, early recognition of the disorder and prompt removal of tonsils and adenoids has been followed by speedy recovery, in all patients.

R. N. ANDREWS, M.D.

FUNCTIONAL HEART DISEASE IN CHILDREN: Mansfield G. Levy, M.D. (*Arch. Ped.*, September, 1925). A functional heart murmur is one whose anatomical cause the author does not know. Although at the present time most textbooks still adhere to the term "functional murmur," the author prefers to discard it, and substitute "atonic," "hemic," "cardio-pulmonary," or "accidental," depending upon whatever he believes to be the underlying cause.

The majority of these so-called functional murmurs are cardio-pulmonary in origin. This murmur originates outside the heart; hence, change in the posture of the child, by altering the relation of the heart to the surrounding viscera, may alter the character of the murmur, or even cause its complete disappearance.

Schlieps uses the term "atonic" for the murmur heard over the hearts of asthenic children. This murmur is usually heard over the apex, differing in this respect from the cardio-pulmonary murmur heard over the base. The atonic murmur is supposed to be due to a relative insufficiency of the mitral valve following a loss of tone of the heart muscle.

The conditions most generally spoken of as functional, and which many times have been found to be organic, are: sinus arrhythmia, certain cases of heart block, including some forms of bradycardia, and the systolic murmurs, heard over the base in the pulmonic area. Not all the arrhythmias or irregularities of the heart, as heard by the stethoscope or felt at the pulse, are simple sinus arrhythmias.

There are organic irregularities that may be explained by the presence of a myocarditis or a pericarditis. The electro-cardiogram is indispensable for accurate diagnosis of these abnormalities.

Occasionally, we meet with cases in which an abnormally slow heart action attracts attention. This may be due to an infection associated with rheumatism, diphtheria, influenza, or other infection. In most of these cases we recognize the slowing as a symptom of some definite affection, and are not likely to refer it to any disease of the heart. When a persistent slowing of the heart is observed in early life, with or without obvious cause, then suspicion must be aroused of the existence of true heart disease.

Recently, Levine of Boston reported a series of blocks, where the ventricular rate was between 50 and 60. How

is one to recognize a blocking of this kind if not looked for by an electro-cardiograph tracing? One might call these cases simple bradycardias, looking for the explanation of their existence outside the heart. Simple systolic murmurs, heard most commonly over the pulmonic area, may or may not be functional.

The author states that the purpose of his paper is to awaken a spirit of thorough investigation of each and every case that comes to us with heart murmurs. Not only will we obtain accuracy in our diagnoses, but such investigation will show how much more uncommon functional conditions are than has been previously acknowledged.

R. N. ANDREWS, M.D.

The complications met with in this series were not different nor in excess of experience with similar elective procedures.

A. L. McDONALD, M.D.

ROENTGENOLOGY

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GYNECOLOGY AND OBSTETRICS

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FRACTURE OF THE FABELLA: Reimer (Fort. a. d. Gebiete d. Röntgen., V. 33, p. 558, June, 1925). The fabella is a periarticular sesamoid lying in the popliteal space in the gastrocnemius. It is constantly present in negroes and certain mammals. It is present in about 15 per cent of white people and is usually bilateral. Rarely it is double on one side.

The author reports a case in which from indirect injury the fabella was fractured. There was a separation of the lateral head of the gastrocnemius confirming the diagnosis. The appearance of the fractured fabella was very similar to the usual appearance of fractures of the patella. There were three fragments. No ill results were noted later after the separation of the gastrocnemius had been repaired.

LEO G. RIGLER, M.D.

GYNEPLASTIC REPAIRS FOLLOWING CHILD-BIRTH: Bubis (Am. Jour. Obst. & Gynec., Vol. X, No. 2). The author presents his experience with a method of making gynecological repairs following delivery or early in the puerperium. His experience demonstrates that repair of old as well as recent lacerations of the cervix, with cystocele; lacerations of the outlet, with rectocele; and hemorrhoids, can safely be repaired at the end of labor or within the first week of the puerperium. In 1922, 169 such cases were operated upon, of which 156 were done immediately, and 13 at intervals during the first week. Most multiparæ present one or more of these lesions and there are many advantages in this course of procedure. It is difficult to get them to return for elective operation. By this procedure they are assured of relief of all symptoms and the stay in the hospital is not greatly prolonged; 37 were discharged in 14 days, 39 in 15 days, 36 in 16 days, and only 8 were kept in the hospital more than 20 days.

The contra-indications are: a known or suspected infection, extreme weakness, post-delivery shock or hemorrhage, phlebitis, varicosities, or the presence of respiratory disease which prohibits a prolonged anesthesia. Contrary to previous teaching, the tissues seem to heal satisfactorily and are not affected by the presence of the lochia.

Types of operations: Trachelorrhaphy, 29; trachelorrhaphy and perineorrhaphy, 71; trachelorrhaphy and cystocele, 1; trachelorrhaphy, cystocele and perineorrhaphy, 7; perineorrhaphy, 43; perineorrhaphy cystocele, 10; hemorrhoidectomy, 3; cystocele, perineorrhaphy, perineorrhaphy and hemorrhoidectomy, 1; trachelorrhaphy, perineorrhaphy and hemorrhoidectomy, 4.

The technic of the conduct of labor and of the subsequent operative procedure is discussed in considerable detail and is worthy of careful study.

A CLINICAL STUDY OF SOME COMMON ANATOMICAL ABNORMALITIES OF THE COLON. II. THE LOW CECUM: Kantor (Am. Jour. Roent., Vol. 14, p. 207, Sept., 1925). The cecum may be abnormally low and fixed or abnormally mobile (cecum mobile). These are congenital anomalies occurring in 18 per cent of all patients.

This condition occurs most frequently in persons of the asthenic habitus and is more common in women than in men.

Patients with a low or abnormally movable cecum may present definite reflex symptoms, the most notable of which are headaches and vomiting. Fifty-nine per cent vomit and 48 per cent have headaches. The nature of the association between the position of the cecum and these symptoms has not yet been determined. The author emphasized the colon as a factor in vomiting.

Appendectomy is very frequently performed in these cases and is rarely of benefit. Appropriate medical treatment may give relief or cure in the majority of cases.

The low or mobile cecum can be diagnosed only by roentgen examination and is an important finding in the examination of the gastro-intestinal tract.

LEO G. RIGLER, M.D.

BOOKS RECEIVED FOR REVIEW

LECTURE CLINIC AND DISCUSSIONS ON ELECTROPHYSIOTHERAPY. 736 pages. Illus. Chicago: H. G. Fischer Company, 1925.

DEVELOPMENT OF OUR KNOWLEDGE OF TUBERCULOSIS. Lawrence F. Flick, M.D., LL.D., Philadelphia. 783 pages. Cloth, \$7.50. Wickersham Printing Company, Lancaster, Pa., 1925.

AN INTRODUCTION TO OBJECTIVE PSYCHO-PATHOLOGY. G. B. Hamilton, M.D. 354 pages. Cloth, \$5.00. St. Louis: C. V. Mosby Co., 1925.

INTERNATIONAL MEDICAL ANNUAL. 43rd year, 1925. 548 pages. Illus. Cloth, \$6.00. New York: Wm. Wood & Co., 1925.

MODERN MEDICINE. Its Theory and Practice. Edited by Sir Wm. Osler, Bart., M.D., F.R.S. Re-edited by Thomas McCrae, M.D. 3rd edition. Vol. I. 845 pages. Illus. Cloth, \$9.00. Philadelphia & London: Lea & Febiger, 1925.

OUTLINES OF PATHOLOGY. E. T. Bell, Prof. of Pathology, University of Minnesota; William A. Riley, Prof. of Entomology and Economic Zoology; B. J. Clawson, Asst. Prof. of Pathology; J. C. McKinley, Asst. Prof. of Neuropathology; William A. O'Brien, Instructor in Pathology; John F. Noble, Instructor in Pathology.

Edited by E. T. Bell. 586 pages. Minneapolis: University of Minnesota Press, 1924.

This book, edited by Dr. E. T. Bell, Professor of Pathology at the University of Minnesota, is one which represents the lectures given in the courses of Pathology at that school, and is a book which every practitioner ought to have in his library. Besides Dr. Bell's contributions, other men in the department have written on their own special field of work, such as the chapters on Neuropathology, Hematology, and Parasitology.

The book is entirely devoid of any illustrations, but, inasmuch as it is not intended to be an illustrated textbook, it is a mighty useful book for the purpose of collateral reading or for the purpose of obtaining a hurried review of any phase of Pathology that may be wanted.

The chapters on the Heart and Kidneys are especially well written and very interesting; the classification of the various diseases, while not exactly the same as is used in other textbooks, is by far the most practical and, seemingly, the most scientific. Especially is this so in the chapter on diseases of the Kidney written by Dr. Bell, whose classification of diseases of the Kidney is by far the best classification of any yet made.

This book ought to occupy a place in every physician's library, because of the fact that it is a compact study, well written, of perhaps one of the most important sciences in medicine.

M. W. ALBERTS, M.D.

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MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association
Northern Minnesota Medical Association and Minneapolis Surgical Society*

Vol. VIII

NOVEMBER, 1925

No. 12

CHOLECYSTOGRAPHY IN ITS APPLICATION TO THE DIAGNOSIS OF CHOLECYSTIC DISEASE*

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During the last fifteen months more than 1,100 patients have been examined at the Mayo Clinic by cholecystography. The sodium salt of tetrabromphenolphthalein and that of tetraiodophenolphthalein were each used, and each salt was administered orally and intravenously. Thus four series require separate description.

SODIUM-TETRABROMPHENOLPHTHALEIN; INTRAVENOUS ADMINISTRATION

One hundred seventy-eight patients were given sodium-tetrabromphenolphthalein intravenously.

The patients were placed in the hospital during the first twenty-four hours, were not permitted to take food or drink after 5 A. M. of the day of examination, and were given no cathartics or enemas. They were given only a glass of milk or a cup of tea at noon, a small amount of water in the afternoon, and a non-protein dinner in the evening. Full diet was resumed the next morning on dismissal from the hospital.

A dose of 4.5 gm. was fixed as the standard. The salt was added to 40 c.c. of triple distilled water, heated slowly and stirred gently until it was dissolved. It was then filtered, sterilized in a boiling water-bath for fifteen minutes and cooled to body temperature for use.

It was found that by dividing the dose the second portion was tolerated better. Accordingly, the dye was administered in two equal portions, one-half hour apart. Whenever possible the median basilic vein was selected, as thrombosis was more likely to occur if the cephalic vein were used. To avoid getting the solution outside the vein, two

syringes were used, one with physiologic sodium chloride and one with dye. After free entrance to the vein was obtained with the former solution, the barrel of this syringe was disconnected and the other containing the dye was substituted. Injections were made slowly, from five to seven minutes being consumed.

Roentgenograms were made as a routine at the fifth, eighth and twenty-fourth hour after giving the dye. Occasionally films were made at other periods, also, but they were rarely of significance.

Notwithstanding the precautions mentioned, more than half the patients experienced systemic reactions in varying degree. In most cases the symptoms were trivial, but in 10 per cent the reaction was marked and in 2 per cent severe.

The typical severe reaction began within five or ten minutes with a sense of uneasiness, followed by pain in the dorsal and lumbar region, flushing of the skin, and a rise of from 10 to 50 mm. in blood pressure, followed within three to five minutes by a sharp fall. With the fall of blood pressure, patients sometimes had intestinal cramps, nausea, vomiting or incontinence of the bowel and bladder. Milder reactions were characterized by flushing of the skin, slight pain in the back and transient nausea. Occasionally a delayed reaction developed four or five hours after injection.

Hypodermic injection of 10 minims of a 1:1000 solution of adrenalin chlorid, just as the blood pressure began to rise after the initial drop, seemed to check nausea and vomiting and to restore the blood pressure to normal.

Systemic reactions occurred especially often in cases of obstruction of the common duct, in cardiovascular disease, and in persons with extremely neurotic tendencies. These conditions soon came to be regarded as contraindications to the test.

Tissue taken from the liver in a few cases at operation and examined microscopically revealed no changes attributable to the dye. By experiments on animals, certain investigators have found that necrosis of the liver may be produced by the drug

*Read before the International Congress of Radiology, London, July 1-4, 1925.

when given in quantities three or four times that required for cholecystography.

Normally, as Graham first pointed out, the gallbladder will retain sufficient dye to cast a shadow at the fourth or fifth hour after administration. This shadow attains its greatest intensity sometime between the eighth and twenty-fourth hours, becomes progressively thinner thereafter, and usually disappears between the twenty-fourth and forty-eighth hours. The shadow is regular in contour and homogeneous. It varies in size and is commonly larger at earlier than at succeeding hours.

Abnormal responses include failure of the gallbladder to fill with the dye, persistent faintness of the shadow, delayed filling, marked delay of emptying, deformity of contour, unvarying size of the shadow, and mottling, or central defects.

Thirty-nine patients of this series were operated on. All proved to have disease of the gallbladder, and twenty-five also had stones.

In nineteen of the twenty-five cases of cholelithiasis, the gallbladder failed to fill with the dye. Shadows of the gallstones themselves were visible in only six cases, either in a preliminary roentgenogram or after the dye was given. Dye entered the gallbladder in six cases; but in two of these the shadow was mottled with transparencies; in one the denser shadow of stones was seen within that of the gallbladder; and in one the gallbladder was faintly depicted at the eighth hour only. In only two cases of the twenty-five could the findings be construed as negative.

A definite lesion of the gallbladder without stones was found at operation in fourteen cases. In eight of these the gallbladder failed to fill with the dye. Its shadow was visible at the twenty-fourth hour only in one case, and at the fifth and eighth hours only in two others. No abnormalities were observed in the remaining three cases. In all of the fourteen cases the pathologist reported chronic catarrhal cholecystitis, two being of the papillomatous type, and five of the strawberry type.

SODIUM-TETRABROMPHENOLPHTHALEIN; ORAL ADMINISTRATION

Following the announcement of Menees and Robinson that they had given sodium tetrabromphenolphthalein by mouth with satisfactory results, an extended trial of this method was carried out. On the supposition that the drug was highly irritating to the stomach, it was at first given in capsules

which had been hardened by dipping in a weak solution of formalin. It soon became apparent that the hardened capsules tended to pass into the large bowel undissolved. Ordinary gelatine capsules were then tried, and, as no distressing effects have ensued, their use has been continued.

No preparation of the patient is required. Preliminary catharsis and enemas are contraindicated. A dose of 0.1 gm. for each kilogram of body weight, but not exceeding 7 gm. of the dye, is given. The ordinary range is from 4 to 7 gm. Capsules of 00 size, which will hold 1 gm., may be used, but capsules of half that capacity are preferable. The patient is instructed to take the capsules at intervals during the evening meal, drinking water freely, and present himself without breakfast for examination the next morning at eight o'clock.

The first roentgenograms are made at about the twelfth hour after the dye is taken. Other films are made at the fifteenth and twentieth hours. After the fifteenth hour the patient is permitted to resume his usual meals.

Reactions following oral administration of the bromin compound have been relatively few and never grave. Occasionally complaint has been made of nausea, a few patients have vomited, and in rare instances catharsis has occurred. That the drug is not excessively irritating to the stomach is indicated by the experience of one patient who emptied his capsules into a glass of water and drank the solution without subsequent distress. One patient, who had had attacks typical of gallstone colic, suffered an attack an hour after taking the dye. As no similar instance has been observed, the attack was probably a mere coincidence. In several cases in which the examination was unsatisfactory, a repetition of the dose on the second or third day produced no ill-effects.

Shadows of the gallbladder obtained by the oral method appear later and are commonly less dense than those observed after intravenous administration. In about half the normal cases the shadow disappears by the twentieth hour. Otherwise, the principles of interpretation and the distinctions between normal and abnormal responses to the test are the same for both methods.

The bromin salt has been given orally to more than 300 patients, of whom 140 have been operated on.

At operation, seventy-one patients were found to have gallstones. In thirty-six cases of this group, no shadow of the gallbladder had been seen; shadows of the stones were evident in seven of the thirty-six. A faint shadow of the gallbladder was noted in fifteen cases. Mottling of the shadow by stones was observed in fifteen cases. In five cases the response to the test was normal.

Marked disease of the gallbladder, without stones, was discovered at operation in thirty-three cases. In sixteen of these the gallbladder had failed to cast a visible shadow with the dye, and only a faint shadow was seen in eleven. In five cases the roentgenologic findings were considered to be normal.

The third group comprised seventeen cases in which the gallbladder when removed revealed pathologic changes of minor degree. At the roentgenologic examination, the gallbladder had failed to cast a shadow in seven, and responded normally in ten.

In the fourth group of nineteen cases, the gallbladder was explored in the course of operation for other lesions, and adjudged to be normal. No abnormality had been discovered at the roentgenologic examination in sixteen of them. In three cases no shadow of the gallbladder was visible.

SODIUM-TETRAIODOPHENOLPHTHALEIN; ORAL

ADMINISTRATION

Sodium-tetraiodophenolphthalein was given by mouth to a limited series of patients. Whitaker and others had previously tried this method with more or less success. The standard dose was 0.08 gm. for each kilogram of body weight, but never in excess of 6.6 gm. to a patient. At first the dye was given in salol-coated pills containing one-third of a gram each. These were taken two at a time every half hour on a fasting stomach with ample amounts of water, on the evening before the day of examination.

Nine of ten patients who received these pills experienced unpleasant effects consisting of free purgation, nausea and vomiting. Although not alarming, these symptoms were so annoying that no more of the pills were given. It is highly probable that the drug contained impurities, as other observers have noted decided reactions from the intravenous administration of the impure salt.

Later, a supply of the pure salt having been secured, it was administered in ordinary gelatin capsules of 0.5 gm. each. These the patient was

instructed to take with the evening meal. Gastrointestinal disturbances have occurred much less often after this modification, but rather more frequently than with the bromin salt given orally.

Roentgenograms were made at the same periods, and under the same conditions with respect to fasting, as in the oral method with the bromin salt, and the same criteria were applied in their interpretation.

Thus far, twenty-five patients have been examined with the iodine salt by mouth. Three have been operated on. All three had given normal responses to the test. In two cases the gallbladder was considered to be normal on exploration in the course of operation for other lesions. In the third case the gallbladder was removed, but only minor pathologic changes were found.

SODIUM-TETRAIODOPHENOLPHTHALEIN;

INTRAVENOUS ADMINISTRATION

Patients to whom the iodine salt was given intravenously were not placed in the hospital, but were subjected to the same dietetic regimen as those who received the bromine salt intravenously, and roentgenograms were made at the same periods. A dose of from 3 to 3.5 gm. was given, dissolved in 28 c.c. of triple distilled water, and administered at one sitting. Preparation of the solution was identical with that of the bromine salt.

No reactions occurred, and this was ascribed in part to exceptional purity and freshness of the drug. In several cases of this series the intravenous test was made as a countercheck in cases in which the examination with the bromine salt, given orally, had been unsatisfactory. Although the tests were separated by only a day or two, no reactions followed the second test. The shadows were somewhat denser than those obtained with the bromine salt.

This series comprised thirty-two patients, of whom eleven have been operated on. Three of the patients had gallstones; in two there had been no shadow of dye in the gallbladder, and in the other the shadow was mottled. Five patients had marked cholecystitis without stones; in three the gallbladder had not been depicted with the dye, while in two the shadows were normal.

Slight disease of the gallbladder was discovered in three cases; in two the roentgenologic examination had been negative, and in the third case the shadow was faint.

RATIONALE AND WEIGHT OF SIGNS

Among the cholecystographic phenomena indicative of disease, failure of the gallbladder to fill with the dye in sufficient quantity to cast a shadow seems to rank first in frequency and to be unexcelled in diagnostic value. Scarcely less reliable is constant faintness of the shadow. Potential causes of complete absence or faintness of the shadow are of two types, namely, those which interfere with entrance of the dye-laden bile into the gallbladder, and those which interfere with concentration of the bile.

A stone obstructing the cystic duct, or a large volume of stones, sand, or abnormally thickened bile in the gallbladder, should mechanically exclude or impede entrance of bile carrying the dye. Empirically, at least, this association has been found repeatedly. Swelling of the mucosa of the duct, spasm, or constricting adhesions would logically also have this effect. Mann has noted rhythmically varying differences in pressure between the gallbladder and the sphincter of the choleduct. Any disturbance causing a constant balance of pressure should hinder the inflow of bile.

Cirrhosis or other grave disease of the liver might hamper excretion of dye in the bile and thus lead to an error of interpretation, but I have encountered no such instance. It is difficult to appraise the effect of hepatitis alone because many other factors are involved, and it is a common accompaniment of cholecytic disease. Rosenthal's experiments tend to show that the liver has a large "factor of safety" and that extensive damage is required to impair hepatic function. At all events, in some cases of this series, in which hepatitis and cholecytic disease were associated, the gallbladder was normally depicted. Not infrequently the shadow of the liver is markedly dense, suggesting that the dye is not being freely excreted, but I have not been able to demonstrate any relation of this density to hepatitis, or even to defective filling of the gallbladder.

Following the introductory work of others, Rous and McMaster have proved that in the dog the gallbladder has the power of concentrating the bile, reducing its bulk by from seven to ten times. This is effected by the removal of water and inorganic salts in the proportions, practically, of physiologic sodium chlorid solution. In the human being it is doubtless this faculty which renders the normal gallbladder visible by cholecystography, accounts

for the differing intensities of the shadow at different periods, and explains its common absence or faintness when the walls of the organ are diseased.

An increase of intensity followed by a diminution is the usual normal finding. This definite order is hardly to be expected always, as it may possibly be modified by the drug used, the method of administration, variation in the period of roentgenography, or failure of the patient to comply with directions as to taking food.

Mottling of the shadow demands some caution in interpretation. When produced by stones which are denser than the dye, there is little chance of error. Mottling due to transparent cholesterin stones is sometimes fairly characteristic in appearance. In many instances, however, the shadow-defects are not markedly different from those caused by gas in an overlying segment of bowel, and this source of error must be guarded against. Papillomas, if of sufficient size, should also produce mottling.

Unvarying size of the shadow at all periods may be construed as evidence that the gallbladder lacks normal elasticity. If, however, the intensity of the shadow varies and is fairly pronounced at any time, unchanging size loses force as an index of disease, and one would hardly venture to base a diagnosis on this sign alone.

By all the methods described, the normal gallbladder seldom fails to cast a shadow on the first films made. After intravenous administration of the dye, a shadow usually remains at the twenty-fourth hour. After oral administration the gallbladder may or may not be empty of dye by the twentieth hour. Moderate delay of filling or emptying, or acceleration of either, may have a significance which will be learned with experience. At present, one is obliged to construe such minor abnormalities with reserve.

Local deformities of contour were rarely observed in this series. In one case a slight flattening of the fundus seemed unrelated to the pathologic changes found at operation. In another the fundus was very pointed, but the gallbladder was deemed to be normal on surgical exploration. Adhesions about the gallbladder were present in several cases, but no deforming effects on the shadow were noted, although such a possibility is obvious.

Apparently least significant of all factors is the position of the gallbladder. In persons of the slender habitus it is usually situated low and mesially,

while in those of the broad habitus it is likely to be placed high and laterally.

ERRORS OF DIAGNOSIS

Despite all care some errors of interpretation seem as yet to be unavoidable, both on the affirmative and negative sides. The affirmative diagnoses of disease appear to be well sustained, and there were few disappointments in the series.

Negative findings with the dye tend to be somewhat less reliable. Occasionally a definitely diseased gallbladder will respond normally to the test as now generally conducted. Even the shadow of a gallbladder containing stones may sometimes have normal characteristics in general.

The most serious obstacle to the accuracy of a negative diagnosis is the gallbladder in which are only minute pathologic changes, probably a residue from more pronounced disease in the past. Such a gallbladder more often responds normally to cholecystography and may be apparently normal on surgical exploration. If the history warrants its removal, it will seldom fail to reveal at least microscopic evidence of disease.

But the failures of the test are not so numerous or glaring as to require apology. Since cholecystography is now at a stage comparable to that of roentgenography of the digestive tract when the opaque meal was first coming into use, it is reasonable to anticipate an increase in its efficiency. With improvement of technic and refinement of interpretation, much more should be learned both as to normal and abnormal responses.

COMPARISON OF METHODS

Intravenous administration of the dye offers advantages in more direct control of the patient, certainty that the specified dose of the drug has been given and emphasis of the shadows obtained. Its disadvantages are the requirement of a punctilious technic and the hazard of local or systemic reactions. With identical technic, the bromin salt given intravenously seems to be more provocative of systemic reactions than the iodine salt, if the latter is pure.

Simplicity and freedom from grave reactions are the principal advantages of oral administration. With either salt, nausea and purgation ensue occasionally. The iodine combination, even when pure, seems to produce these discomforts more often than the bromin. Vomiting after taking either drug, unless early, has apparently had no material effect on the shadow. It has seemed to occur less fre-

quently in patients with diseased gallbladders than in patients who responded normally to the test and were believed to have no such disease. Dye in the intestinal contents produces shadows which may be a little confusing and might possibly conceal the shadow of the gallbladder, but such circumstances are infrequent. Lack of certainty that all of the drug has been taken is another minor objection. The question may also arise as to whether defective absorption from the intestine may not be a cause of abnormal findings. However, all these objections and doubts seem to have little basis, for in this series the diagnostic results from all methods have been about equal.

From these considerations it will be apparent that my present preference is for the oral use of the bromin salt as a routine, and the iodine intravenously to check doubtful cases.

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I have taken this text because it seems to meet a vital need in medical practice today. Medical education has extended and broadened to a point where we are turning out better scientists than doctors. Attention is being concentrated upon the disease to the exclusion of the suffering patient. Exhaustive laboratory methods and technical tests can never take the place of the intimate personal attention and encouragement the sick man craves. Too much science and too little human interest drives him to the quack, where he receives a personality study, a satisfaction for mental distress, and some treatment at least for the symptoms of which he complains. He has been treated as a man who is sick rather than as the possessor of an interesting disease; or, he has received a careful consideration of his complaints, rather than a hrusque statement that physical and laboratory examinations show there is nothing the matter with him. We have wandered in our search for truth too far from the "old-time doctor" attitude toward his patient. Too often the patient has been the mere vehicle of an interesting disease and the pathology of the condition has occupied the center of the stage to the exclusion of the patient himself. Either this, or, finding no pathology, we have lost interest, become impatient, and dismissed one unfit for life through mental suffering. What the quack cures is not always "imaginary" ills. The physical basis may be slight, but it is very real to the patient. He persuades himself he has a very serious condition. A vicious circle is formed. Fear masters him. Sleep and appetite fail or are impaired. He becomes introspective, morbid and depressed, exercises less, becomes over-careful of his diet. He then develops a host of minor symptoms consequent to his changed habits of living, but which he believes due to his disease. We have presented to us, then, the typical psycho-neurotic, who comprises from one-third to one-half of every general practitioner's practice, who is the least understood and the most in need of understanding. We have the type who wanders from physician to physician, and, failing to be understood, finally forsakes orthodox methods, falls into the first trap set by quackery and is often cured.—Rock Sleyster, *Wis. Med. Jour.*, Dec., 1924.

PRACTICAL CONSIDERATIONS IN THE DIAGNOSIS OF CHRONIC ABDOMINAL DISEASE*

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Perhaps the greatest single factor in the diagnosis of chronic abdominal disease is the ability to establish definitely the presence or absence of a lesion in the stomach or duodenum. With almost any type of abdominal lesion, if the manifestations are chronic rather than acute, the distress is mainly referable to the digestive tract, and dyspeptic symptoms are in the foreground. Eliminating malignancy from consideration, these symptoms fall into two main groups: reflex dyspepsia and ulcer dyspepsia. The common causes for the former, in the order of their frequency, are: chronic constipation, especially if the patient has the cathartic or enema habit; cholecystitis, with or without stones; chronic appendicitis; the degenerative hepatic diseases, such as the cirrhoses, and chronic pancreatitis. In this connection it might be said that dyspepsia is also common in disease of the urinary tract or pelvic organs, although its symptomatic importance is so secondary as rarely to complicate the diagnostic situation.

Of this entire group, only the dyspepsia associated with chronic cholecystitis exhibits sufficiently definite and constant features to constitute a syndrome of differential importance. One outstanding feature of this digestive upset, as of all reflex dyspepsia, is its tendency to constancy rather than intermittency. Qualitative food distress is a constant feature, and food selection in this group is governed by certain principles with considerable uniformity. Aside from the characteristic but possibly infrequent acute attacks of gallbladder colic, definite pain is not a feature. The dyspeptic symptoms occur immediately after the ingestion of food and tend to improve as the upper digestive tract empties itself. The distress is entirely in the upper abdomen, and characterized as a distension or full feeling with pressure upward and a constant desire to belch. There is burning distress in the stomach with acid eructations, usually definitely

*Read before the Rock Island and Scott County Medical Society, Moline, Illinois, April 14, 1925.

Also read before the Southern Minnesota Medical Association, Owatonna, May, 1925.

but temporarily relieved by soda. A careful selection of diet, cutting out all fats, the greasy or fried foods; highly acid foods, such as many of the raw fruits; and well-known indigestibles, such as cabbage, pickles, salads, and so forth, will markedly improve this type of dyspepsia.

The single condition, contributing perhaps to more instances of serious gastro-intestinal upset than any other, is the one variously referred to as neurosis, chronic nervous exhaustion, or neurasthenia. A group of 100 cases was studied in which the foregoing condition was diagnosed. While the symptoms ascribed to functional neurosis are legion, and their multiplicity is their characteristic feature, in 26 per cent of the patients coming to the Clinic with functional troubles the presenting complaint is referable to the stomach.

The clinical picture of chronic nervous exhaustion is characteristic. Usually, although a presenting complaint is mentioned first, there is also a conglomeration of more or less distressing symptoms affecting all the systems and regions of the body. The background of family characteristics, early life and environment, and the evidence of constitutional nervous instability, form a picture to which the elaborate modern examination is a relatively unimportant adjunct. The striking feature about nervous dyspepsia is the amount of distress that these patients may suffer. Disability or complete prostration are not at all unusual, while in cases of uncomplicated ulcer they are the exception, and when they exist the completeness or accuracy of the diagnosis should be questioned. The distress in cases of nervous dyspepsia comes very soon after the ingestion of food. There is usually some relief from soda, but relief from food is practically never obtained. The characteristic thing about the qualitative food distress is its complete lack of uniformity, either in the group or the individual. It follows no dietary principles and exhibits no rationale. Personal idiosyncrasy is the dominant factor, and the tendency is to deplete the diet to the point of malnutrition and serious constipation.

Eliminating from consideration once and for all such obsolete diagnosis as "chronic gastritis" and "catarrh of the stomach," the more common diseases of the upper digestive tract practically narrow themselves to carcinoma of the stomach and gastric and duodenal ulcer. Carcinoma manifests itself as a more or less rapidly progressive, wast-

ing disease, with a train of symptoms that need no discussion here. The difficulty of diagnosis exists mainly in the first few months.

The statistics recorded here are from the personal observation and review of 100 cases of duodenal ulcer, in which the diagnosis was corroborated at operation. From a symptomatic standpoint, the four most important features in the diagnosis of peptic ulcer are chronicity, intermittency, meal relation, and food ease. These four points, of almost equal importance, form the framework about which the ulcer syndrome is constructed. Chronicity in this connection has a two-fold meaning: first, that the condition does not tend to be self-limiting, but rather to exist for years; and, second, that if uncomplicated it is distinctly non-prostrating. The average duration of symptoms in the series studied was eleven and one-half years, and the longest was forty-nine years, while only in 8 per cent was it less than two years.

Periodicity, meal relation, and food ease are so uniformly present that they are almost essential to the diagnosis. In 90 per cent of the histories studied, the symptoms were definitely intermittent; 91 per cent of the patients described the pain or distress as coming on from one and one-half to four hours after meals, and in 97 per cent the distress was relieved completely, or to a large extent, by taking food or soda. The small percentage of cases not showing these features were carefully studied, and the discrepancy can be explained either by the presence of serious complicating features, such as perforation, gastric retention, or disease in the gallbladder, or by the inability of the examiner to procure a satisfactory history, mainly from patients who do not speak English.

A history of previous hemorrhage was obtained in 16 per cent of the cases. This symptom has never assumed any great importance from a diagnostic standpoint. A relatively small percentage of the patients who come to the Clinic primarily on account of vomiting or spitting up blood are found to have ulcer, while a history of hemorrhage^{as} say nothing of its dependability, is elicited^{ease}, relatively small percentage of cases. Later the ulcer. Sixty-eight per cent of the r^{er}, and in the initial circumference^{an} gave a history of being frequent^{an} between midnight and 2 or 3 a. m. transverse diameters^{an} ilar to that complained of at c^{er} birth the thoracic could be relieved by food or^{between the antero-}

There was a seasonal incidence of distress in only 28 per cent; vomiting, not associated with gastric retention, occurred in only 15 per cent.

These percentages are given to indicate the relative importance of the classical symptoms of ulcer. The diagnosis of ulcer does not, fortunately, rest on the clinical picture alone, but with modern methods of examination the importance of the clinical picture is frequently underestimated, not merely as it affects diagnosis, but as it may affect treatment and prognosis.

Without doubt, the most important recent development in the diagnosis of disease of the upper intestinal tract has been roentgenology with the opaque meal. It must not be forgotten, however, that this is the most difficult field in the whole scope of x-ray diagnosis, and except in the hands of an experienced and competent roentgenologist is of less value than a good clinical opinion. An increasing number of patients are coming with a diagnosis of ulcer which we are unable to verify. On the other hand, however, when our diagnosis has been ulcer, previous opinion has usually agreed with it. To paraphrase an old saying: Many things resemble an ulcer, but an ulcer resembles nothing else.

During 1924, in the Mayo Clinic, 11,895 x-ray examinations of the esophagus, stomach, and duodenum were made. There were 834 patients on whom a primary operation was performed for duodenal or gastric ulcer. In 3.83 per cent, a negative diagnosis was made from the x-ray, and an ulcer was found at operation. In 2.65 per cent the reverse was true, making a total error of 6.5 per cent. In 1921, Carman reported an error of 10 per cent. We come now to a consideration of the real value of the clinical picture. First it must be understood that one is not able, from the x-ray, to distinguish between an active ulcer and either a symptomless or a healed ulcer. A study of postmortem statistics

forces the conclusion that many ulcers exist for varying lengths of time and heal spontaneously, never producing sufficient distress to send the person to a physician. The co-existence of other abdominal lesions with an ulcer, or the importance of the ulcer as a cause of the chief complaints, are matters on which the x-ray can throw no light, and the necessity for their accurate determination cannot be underestimated. It is interesting to note that, aside from the small group of definite post-operative complications, the great majority of patients dissatisfied with the results of an operation for ulcer are those in whose preoperative history the definite ulcer syndrome is either absent or insignificant. It must be borne in mind that an ulcer and a functional syndrome may be contributing equally to a train of symptoms which, in the patient's mind, is due to a single cause. A severe migraine is more distressing than the average ulcer dyspepsia, and if both are present the migraine is likely to be the disturbance for which relief is sought.

CONCLUSIONS

An essential feature in the diagnosis of abdominal complaints is the proving or ruling out of lesions in the stomach or duodenum. Roentgenology, when its findings are reliably interpreted, is the most valuable aid in this process. Clinical judgment and experience have not been discredited by the development of modern laboratory resources and are still the deciding factor in the final summing up of the evidence. Diagnosis is fruitless if it has not pointed the way to treatment. Unnecessary or poorly conceived treatment, especially surgical, still constitutes the greatest indictment of the medical profession.

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WHAT CONSTITUTES A SATISFACTORY DRUG?
 diet
 quent a summary of the requirements for a drug that lies due a satisfactory therapeutic agent has the typical psy W. G. Christiansen of the Medical School to one-half of every. The first dictum is that the essence least understood should be far below the toxic dose. We have the type is extremely advantageous. Stabil- cian, and, failing to be value. Drugs that are readily solu- methods, falls into the value. Drugs that are readily solu- often cured.—Rock Sley rbed are to be preferred. Drugs

for injection should not only be soluble, but should withstand sterilization and should not injure the tissues. To act efficiently, the substance should not be excreted or destroyed in the body before it has had time to act on the infective agent, nor should it be excreted so slowly that cumulation in the internal organs gives rise to symptoms of poisoning. Finally, tolerance to the drug should not be readily developed by the parasite against which the drug is to be used.

(*Jour. A. M. A.*, Sept. 19, 1925, p. 902.)

THE LUNGS IN INFANCY AND CHILDHOOD

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As usually employed in physiology, the term respiration refers to the process of gaseous exchange between an organism and its environment, consisting essentially in the absorption of oxygen and the elimination of carbon dioxide. Respiration in some form is one of the fundamental characteristics of all living things. In unicellular organisms the gaseous exchange takes place directly, but in the more complex animals a special form of respiratory apparatus is developed to carry on this function.

The foundation of our present knowledge of respiration we owe to Lavoisier, the discoverer of oxygen. By his epochal work from 1771 to 1780, he explained combustion as an oxidation, and showed that in respiration the same process occurs, in that the blood takes up oxygen from the inspired air, and gives back to it the products of combustion developed within the body, namely, carbon dioxide and water.

The beginning of the advance in our knowledge of lung capacity dates from the invention of the spirometer by Hutchinson in 1859, and augmented subsequently by the perfection of methods of analysis of the expired air. It is the consideration of lung capacity, particularly the vital capacity, and tidal air in children with which this paper is concerned. Before entering into a discussion of these measurements, a general consideration of certain features of respiration in children as compared with adults will be attempted.

The act of inspiration results in an enlargement of the thoracic cavity produced by the descent of the diaphragm and by the elevation of the ribs. The descent of the dome of the diaphragm enlarges the chest cavity mainly in the vertical direction. A rise of pressure which is transmitted to the abdominal cavity causes the abdominal walls to protrude and results in what is spoken of as diaphragmatic or abdominal respiration. In this type of respiration the abdomen bulges outward first, followed immediately by a wavelike upward expansion of the movement which is gradually lost over the thoracic region. This is the general type of inspiratory movement characteristic of children and

also of adult males. In girls after the age of puberty a more marked movement in the thoracic region is often encountered. Here the upward rotation of the downward slanting ribs enlarges the chest in the lateral and also in the dorsoventral directions. Undue emphasis apparently has been placed upon this costal or thoracic type of respiration in considering it a sexual characteristic of females, for in women, particularly of foreign countries, who have not the custom of wearing tight corsets, the abdominal type of respiration predominates. Furthermore, if tight dresses are discarded, in time little or no difference is found in the respiratory movements of the two sexes. The natural type of respiratory movement is one fairly well balanced between the chest and abdomen, the abdominal type being somewhat more pronounced. In labored respiration, however, the thoracic movements are greatly increased.

In the fetal period the lungs and other thoracic viscera completely fill the chest, the lungs being completely atelectatic. The *x*-ray plate of the chest of the stillborn infant shows the thorax and abdomen to be ovoid in shape, with the lower ribs flaring somewhat to conform with the wide upper portion of the abdomen. The upper pole of the thoracic cavity is narrow, and the ribs slope definitely downward. There is an even density throughout the lung fields, making it impossible to differentiate the heart shadow from the lung tissue. Immediately after respiration starts there is a distinct change in the contour of the chest. The ribs become elevated and extend horizontally at right angles to the spine rather than downward as found in fetal life. It is not until considerably later that the downward slanting of the ribs characteristic of the adult is again developed. The entrance of air into the lungs brings the heart and mediastinal shadows into clear relief in the *x*-ray plate.

The horizontal circumference at the nipples (Scammon and Rucker) is markedly increased with the first inspiration. Within twelve hours after the birth the circumference begins to decrease, which continues for two or three days. Later the chest circumference again increases, and in the second week of life regains the initial circumference present at the first inspiration.

The anteroposterior and transverse diameters show similar changes. Before birth the thoracic index (*i.e.*, the relationship between the antero-

posterior to the transverse diameter) at the nipples is about 86. With the establishment of respiration the anteroposterior diameter increases to such an extent as to exceed the transverse diameter. The thoracic index therefore rises to an average of 106 with the first inspiration and later drops to about 102 in the first twenty-four hours. By the middle of the second week it has decreased to slightly more than 100. With the beginning of respiration therefore the sternum moves upward and forward, greatly increasing the anteroposterior diameter of the chest. Later in the adult the chest is flattened to such an extent that the thoracic index is between 70 and 75.

During respiration the intrapulmonic pressure undergoes slight fluctuations. When at rest, the air pressure within the lungs is equal to the atmospheric pressure. With quiet inspiration the intrapulmonic pressure falls 9 to 10 mm. of water below atmospheric pressure. In normal expiration a rise occurs of about 8 mm. of water. Forced expiration and inspiration, however, may cause fluctuations of 80 to 100 mm. of mercury.

The first successful determinations of the pressure within the pleural cavities apparently were made by Aron in 1891. He found that in adults the pressure within the pleural cavities is slightly lower than the atmospheric pressure. This is due to the fact that the atmospheric pressure distending the lungs is reduced by an amount equal to the elastic recoil of the distended lung tissues. Aron measured the intrapleural pressure by means of a cannula connected directly with the pleural cavity in thirty-six healthy adults. At the end of quiet inspiration the negative pressure was found to be 4.64 mm. of mercury and 3.02 mm. of mercury at the end of expiration. With quiet respiration therefore the variation in intrathoracic pressure amounts to about 1.02 mm. of mercury. The development of a negative intrathoracic pressure apparently is a postnatal process. After birth, until the fourth day, Hermann (1883) was unable to demonstrate a measurable negative measure in the pleural spaces. By the eighth day he found a negative pressure of only 0.4 mm. of mercury. The early development of a negative intrathoracic pressure no doubt exerts a favorable influence in counteracting any tendency for a return of pulmonary atelectasis characteristic of fetal life. The very low intrathoracic pressure in the infant probably has some influence upon the vital capacity

of the lungs at this period. This point will be considered later.

The volume of air expired during a single quiet respiration has been determined by Von Recklinghausen (1896) for the newborn. On the day following birth in quiet respiration during sleep a normal infant weighing 3,000 grams expired an average of 19.5 cm. at a single expiration. Since the respiratory rate was 62 per minute, approximately 1,200 c.c. of air were expired in one minute. During the first nine days after birth the amount expired averaged about 22 c.c. The amount of air passing through the lungs per minute for each kilo body weight amounts to about 400 c.c. for the newborn. The averages found by other observers for the tidal air during the newborn period are somewhat higher than those of Von Recklinghausen. Dohrn (1858) found an average of 38 c.c. on the first day, 44 c.c. on the fifth day, and 50 c.c. on the tenth day. During crying, the tidal air increases about 8 c.c. per inspiration. In older children Gregor found the tidal air to average about 129 c.c. at twelve months, 220 c.c. at seven days, and 395 c.c. at fourteen years. For the adult weighing about 60 kgm. the tidal air is approximately 500 c.c. Since the respiratory rate at this age is in the neighborhood of sixteen per minute, about 9,000 c.c. of air pass through the lungs in this length of time, which amounts to about 150 c.c. per minute for each kilo body weight. If we accept the findings of Von Recklinghausen the pulmonary ventilation per unit of weight occurs nearly threefold as rapidly in the newborn as in the adult. From the period of infancy to the adult, the findings indicate that the tidal air increases approximately twenty-five times, whereas the volume of air passing through the lungs per minute increases only seven and a half times.

The volume of the undistended lungs was found by Cuby (1830) to be about 75 c.c. at birth and 1,600 c.c. for the adult male. The tidal air therefore equals nearly one-third of the total lung volume both in the newborn and in the adult.

Although 500 c.c. of air are breathed in at a single inspiration by an adult, considerably less than this amount enters the alveoli with each respiration. It is estimated by Loewy that the volume of the bronchial tree in adults is about 140 c.c. At each respiration therefore only about 360 c.c. of air enters the alveoli. Under normal conditions the amount of air in the lungs in adults at the end

of quiet expiration is about 2,600 c.c. The addition of 360 c.c. on inspiration adds about one-seventh to the volume of air of each alveolus provided the air is evenly disseminated throughout the lungs. Once in the alveoli, diffusion occurs very rapidly, as shown by the experiments of Grieshaber. He breathed in 500 c.c. of hydrogen and then determined the amounts breathed out in successive expirations. About 170 c.c. were recovered in the first expiration, 180 c.c. in the second, 41 in the third and 40 in the fourth.

The air in the alveoli is in contact with a vast expanse of alveolar epithelium. It is estimated that the total surface area of the pulmonary alveoli is 900,000 sq. cm. in the adult as compared with 55,000 sq. cm. at birth. As pointed out by Loewy and Von Schratten (1905), this large alveolar surface area makes possible for more than 6,000 c.c. of oxygen to diffuse into the blood per minute. Normally, however, in quiet breathing only 250 to 300 c.c. of oxygen are absorbed per minute, and not more than ten times this amount in violent respiration. This large surface area present in the lung of adults is developed largely by the post-natal growth in size of the pulmonary alveoli rather than due to an increase in the number of alveoli. It is estimated that after birth the number of alveoli increases only 1 to 2 per cent; however, there is a very great increase in the size of the alveoli.

Studies of the vital capacity of the lungs have revealed many interesting features, particularly in recent years. In adult man the vital capacity averages about 3,700 to 4,000 c.c. At this period, as shown by Dreyer (1919), the vital capacity bears a fairly constant relationship to the 9.72 power of the weight in grams, to the square of the sitting height in cm. and to the square of the chest circumference in cm. The average value for the constant expressing the relationship to the sitting height, as obtained by Dreyer, for males is 1.9. This value is also obtained for children after they have reached a sitting height of 87 cm. and above. For smaller children the value for this constant becomes progressively greater, amounting to 2.71 for children having a sitting height of 53 cm. From this it follows that the vital capacity is relatively smaller in young children than in older individuals. If the tendency is for the vital capacity to become progressively smaller the younger the child, one would naturally expect this measurement to be exceedingly small at birth, although to date

apparently no observations have been made at this period.

In the adult the vital capacity of the lungs includes the tidal air or the volume inspired during quiet respiration, the complementary air or the greatest amount possible to force into the lungs after a quiet inspiration, and also the supplemental air or the maximum amount that may be expelled from the lungs after quiet expiration. At birth, since there is no negative pressure in the pleural spaces, the lungs are completely emptied with quiet expiration except for residual air. At this period evidently there is practically no supplemental air present in the lungs. In the newborn, therefore, the vital capacity includes only the tidal and complementary air, and consequently must be relatively much smaller than at older ages. The attainment of the normal adult relationship, so far as the vital capacity is concerned, probably is dependent in a measure upon the complete development of the supplemental air, as well as the complete voluntary control over the muscles of inspiration and expiration.

The requisite of an unusually rapid pulmonary ventilation with a relatively small vital capacity in the newborn are probably factors accounting for the great seriousness of pulmonary pathology during this period. Difficulties in respiration are very frequent in the newborn infant, and various methods of artificial respiration are often employed in treating such conditions. In a series of cases reported by Evans (1922), where insufflation of the lungs at birth was done, by means of a gas machine, apparently little demonstrable change was produced in the lung. In all cases, however, air had been forced into the stomach and intestines, the distension of which might have a deleterious effect upon respiration. Evans also was unable to inflate the lungs of the stillborn by means of a tracheal catheter. By this method the alveoli were easily ruptured, with the development of a pneumothorax. He states that usually a pressure of 10 mm. of mercury is considered the upper limit of safety in forcible expansion of the lungs in infancy.

Although at present the vital capacity has not been determined for the period of infancy and early childhood, nevertheless, rather extensive observations are recorded in the literature for children six years of age and older. These studies have shown conclusively that the vital capacity averages greater in boys than in girls of the same age and

size. Since at corresponding ages and sizes the observations show a considerable degree of variability, some difficulty is occasionally experienced in interpreting readings in individual cases. Statistical analysis of data for children (Stewart, 1922) indicates that 75 per cent of the child population have vital capacities equal to or above 90 per cent of the average for corresponding age or size, whereas only 25 per cent of children have vital capacities falling 10 per cent or more below their expected normal. By computing the extent of the deviation of individual readings from the expected normal vital capacity, one may readily classify the patient as to the group to which the child belongs. Children falling into the group representing the poorer one-fourth of the child population are children who probably deserve special study to eliminate pulmonary or cardiac disease as a factor causing their low standard of physical fitness.

In clinical work single determinations of the vital capacity are of value in connection with the examination of patients having disease of the heart or lungs. Repeated measurements, however, are of greater value in permitting the physician to follow the course of the disease, for changes in the pathological conditions are immediately reflected by fluctuations in the vital capacity of the lungs. It is undoubtedly inadvisable to rely upon the determination of the vital capacity to the exclusion of other means of making a diagnosis, for occasionally this measurement is very misleading, and might lead to serious error if relied upon alone. However, with the exercise of proper judgment, one usually is able to use the vital capacity findings safely and profitably in determining the presence and also roughly the extent and progress of the disease of the heart or lungs.

SUMMARY

1. The horizontal circumference of the chest at the level of the nipples is markedly increased with the first inspiration. Within twelve hours after birth the circumference begins to decrease, which continues for two or three days. Later the chest circumference again increases, and in the second week of life regains the initial circumference present at the first inspiration. The anteroposterior and transverse diameters show similar changes.

2. With the first inspiration the thoracic index increases from 86 to 106. By the middle of the second week it has decreased to slightly more than 100. Later in the adult the chest is flattened to such an extent that the thoracic index is between 70 and 75.

3. At birth there is no demonstrable negative pressure within the pleural cavities, and by the eighth day it amounts to only 0.4 mm. of mercury. In the adult the negative intrathoracic pressure is 3.02 mm. of mercury at the end of quiet expiration, and increases 1.62 mm. of mercury on quiet inspiration.

4. The volume of air expired during a single quiet expiration is about 19.5 c.c. on the first day of life, and about 500 c.c. for the adult.

5. The volume of air passing through the lungs per minute for each kilo body weight is nearly threefold as great in the newborn as in the adult.

6. The vital capacity of the lungs is relatively small in young children, particularly in the newborn. The normal adult relationships are not developed until about the age of puberty.

7. Determinations of the vital capacity of the lungs have a distinct clinical value, for observations have demonstrated that the development of changes in pathological conditions of either the heart or the lungs immediately influence the vital capacity of the lungs.

IMMUNIZATION AGAINST SCARLET FEVER

Probably the best estimate of immunization with scarlet fever toxin is contained in the following quotation from an article by George F. Dick and Gladys Henry Dick of the skin test for susceptibility to scarlet fever and the preventive immunization with scarlet fever streptococcus toxin: "The New York City Health Department has employed scarlet fever toxin in preventive immunization on a large scale, but has given it in doses too small completely to immunize a majority of susceptible persons. Zingher (The Dick Test in Normal Persons and in Acute and Conva-

cent Scarlet Fever Cases, *The Journal*, Aug. 9, 1924, p. 432) reported the use of 100, 250, and 500 skin test doses, a total of 850 skin test doses. Toxin put up in this inadequate dosage has been widely distributed by commercial firms." The report of the Dicks shows that when from 1,000 to 3,000 skin test doses were injected, only 14.3 per cent were completely immunized. When from 5,000 to 6,000 skin test doses were injected, 66 per cent were completely immunized. When from 10,000 to 12,500 skin test doses were injected, 91.8 per cent were completely immunized. Correct increase of dosage is all-important.

(*Jour. A. M. A.*, Sept. 19, 1925, p. 923.)

INDIRECT INGUINAL HERNIA AND ITS RELATION TO ACCIDENTS AND WORK- MEN'S COMPENSATION*

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The word hernia is probably derived from a Greek word meaning a branch or offshoot. The ancients used the Latin word, *kele* (a swelling), and combined it with a word which designated the contents of the swelling, such as *enterocele* or intestinal hernias, and *cystocele*, meaning bladder hernia. The oldest printed Latin editions of the Bible used the word *herniosis* and Chaucer in the fifteenth century used the word *hirnia*.

Inguinal hernia is doubtless as old as the history of man. Among the ancient records a Phoenician statuette of about 900 B. C. shows a double inguinal hernia treated by a bandage. Hippocrates in the fourth century B. C. wrote about hernia. The Roman physician, Celsus, who lived in the first century, was the first to operate for hernia. He made an incision over the hernia, loosened the sac, and probably ligated and removed it. He thought it was both unnecessary and dangerous to open it. In large hernias he cauterized the parts with caustic or a hot iron. Celsus speaks of practitioners who placed the empty sac between pieces of wood and applied pressure until gangrene developed.

Antiseptic surgery, introduced by Lister, ushered in a new period in the treatment of hernia. Open operations displaced the blind and uncertain procedures of the past with the result that more progress was made in twenty years than in all the centuries that had gone before.

A knowledge of the anatomy of oblique inguinal hernia is necessary to an understanding of the cause of hernia. A consideration of the anatomy of the inguinal region shows this to be congenitally a weak point in the abdominal wall.

The inguinal canal along which inguinal hernia travels is an oblique opening in the abdominal wall about an inch and a half long parallel to the inner half of Poupart's ligament and a little above it. It extends from the internal abdominal ring to the external or superficial abdominal ring. (In the male, after the descent of the testis at about the sixth month of fetal life, the canal contains the

ilio-inguinal nerve, the genital branch of the genito-crural nerve and the spermatic cord.

Little has been added to our knowledge of the descent of the testis since the observations made by John Hunter in 1762. In early fetal life the testes are located at the back of the abdominal cavity behind the peritoneum and below the kidneys. During the seventh or eighth month the inguinal conus and attached testis are drawn downward into the inguinal canal and through it until shortly before birth the testis reaches its position in the scrotum. The retroperitoneal position of the testis is always retained, the testis and the constituents of the spermatic cord descending outside of the peritoneal pouch which extends into the scrotum.

For a time free intra-abdominal communication is maintained by the tubular *processus vaginalis*. Usually by the time of the birth or shortly after, this canal is obliterated. The *processus vaginalis* is the entire pouch of peritoneum which accompanies the testis and cord. It is divided into two portions, the funicular process, which surrounds the cord, and the *tunica vaginalis testis*, which surrounds the testis.

If the *processus vaginalis* does not become obliterated, a congenital hernial sac results which may become a hernia either at birth or in later life. In 1899 Russell of Australia stated that all oblique inguinal hernias in both adults and children were congenital in origin and were due to a persistent patent funicular process. In his further study of this subject he made the following conclusions:

1. The inguinal hernia in young subjects is caused by the presence of a congenital sac and there is no other cause.

2. Acquired hernia in the young has no existence in fact.

3. All cases of oblique inguinal hernia occurring at any time of life occur in subjects who are the possessors of a congenital sac.

4. Subjects who have never possessed a sac or who have had the sac efficiently removed can never become the subjects of oblique hernia.

5. I am unable to find any evidence of any kind in favor of the belief that oblique inguinal hernia ever occurs at any age independently of the presence of a congenital sac.

Social legislation in the way of compensation laws brought hernia into the courts with all its medico-legal questions.

*Read at the midsummer Range meeting of the St. Louis County Medical Society, August 8, 1925.

Mock, in his excellent book on industrial surgery, speaks of a new viewpoint that began to permeate industry during the first ten years of the present century. He says that it was characterized by a greater consideration of the rights of the workingman by his employer, a more humane attitude which took into account certain moral responsibilities not included in the purely legal obligations. This new attitude on the part of industry was exemplified by the fact that some of these companies paid full wages during disability.

Whenever an accident occurred, if there was any moral responsibility attached, even though legally they might sidestep the laws, compensation and free surgical care were given. The question of legal rights did not enter into the plan of these industries. They recognized certain moral responsibilities and needs, realizing that it was good business to improve the conditions of their employes and thereby make them more useful and efficient. Among such broad-minded employers, the question of whether there was such a thing as traumatic hernia for which they could be held legally responsible did not cause much concern. They were not governed by the decisions of established medicine nor of established law, but based their decision on a good and just business sense. If they employed a man with hernia they knew the industry was not responsible for it. If it grew gradually worse, without any cause, again they were not responsible. But if, as a result of accident or severe strain, the hernia became strangulated, at once doubt as to responsibility entered the case and the decision was rendered in favor of the employe. If they hired a man who showed no sign of rupture at the employment examination, but later suffered an accident or severe occupational strain and as a result hernia appeared, compensation and free surgical care were given because in the man's mind the accident caused the trouble. From the standpoint of efficiency it was found that a man with hernia was about 25 per cent less efficient than the man without one. Therefore, these concerns might refuse to employ men with a rupture, but they became more and more liberal regarding the repair of such a condition when it developed in the old employes. Such, says Mock, was the attitude of several concerns at the time of the passage of the employes' compensation acts. In fact, these very laws were an expression of this new, humane influence which had

entered industry. The administration of these acts was placed in the hands of industrial commissions who were laymen rather than lawyers. Influenced by the generous attitude of certain industries and guided by this sentiment and a consideration of moral rights, the decisions of these commissions were often very liberal. Thus employes began to seek compensation for many conditions which heretofore had never been considered compensable and included among these were hernias which developed during employment.

If all industries and companies took the same liberal and broad-minded attitude toward compensation of hernia that these companies of which Mock speaks took previous to the passage of compensation laws, there would be very little controversy or conflict over the matter of compensation for hernias said to have appeared during labor hours, for under such a system of liberality on the part of the employer practically all hernias would be compensated without question. However, this liberal and wide-open policy is not the general attitude of employing companies. The companies and industries are undoubtedly all willing to compensate an actual injury, but when there is a question as to whether there has been an actual injury to the employe, they are not always willing to pay the claim without trial in the courts or before the industrial commissions for final decision. Among the claims that are contested by both the employer and the employe we find hernia to be one of the fields of the greatest controversy and dispute.

Compensation laws are a part of social legislation. Social legislation dates as far back as the middle ages, but until the latter part of the nineteenth century, medicine had little concern with such legislation. The Emperor of Germany in 1881 first advocated the adequate protection from injury of the workingman by the passage of compensation laws. Three years later such a law went into effect in Germany. In 1887 Austria passed a compensation law. Norway's first law providing for compensation dates from 1894. England's first real social legislation was enacted in 1897. Denmark, France and Italy have had compensation laws since 1899. Hungary, Norway, Sweden, Holland, Belgium, Luxemburg, Switzerland, Spain, Finland and Australia all have compensation laws. In our own country we were slow in taking up this cause of the injured workingman, but at the present

time practically all of our states have enacted some form of compensation laws. It has really become a nation-wide movement and with the development of this particular branch of social legislation has come a corresponding development of medicine in its relation to industry. The demands that have been made upon us and are being made upon us as physicians by employers, employes and industrial commissions have compelled us to obtain more knowledge of trauma and its effects. We will have to study more of the rôle which trauma plays in the etiology of various diseases, and we will have to learn to put a more and more equitable value upon permanent disability from injuries and permanent partial disabilities from injuries. We must learn to make a prognosis in these cases which is based upon experience and observation of a large number of cases and not on a mere guess.

Since the passage of these compensation laws and the large amount of controversy that has arisen over the compensation of hernias, many papers have appeared in medical literature on this subject.

Berger, in the opening sentence of his well known monograph, goes far to explain the entire foundation of the voluminous discussion as to hernias and accidents when he says: "There is not an individual who having a hernia at the moment when he noticed its existence did not at once attribute it to an accident." So we have a fixed idea inherent in the human race to combat as well as the opinion of referees, boards and courts. Many surgeons believe that practically no hernias are of traumatic origin and that they should not be compensated. Many labor leaders and social workers believe that all hernias are traumatic and that all should be compensated. The logic of the matter is just the same as it usually is in the case of extremes—that the truth lies somewhere between the two.

Wainwright, who has had a large experience in industrial surgery, says that it is his feeling that the present legal and lay attitude is unsound, unscientific and is at variance with firmly established medical facts and that the attitude of courts and compensation boards is chaotic. Many authors think that confusion has arisen from the use of the word *rupture* as synonymous with *hernia*.

Rupture is an old English word and indicated disease; but that is not the modern understanding of the word. To every one now, it means a tear and therefore an accident. As one author states,

a biased conception is formed by the tearing and ripping sound of the cold word, *rupture*.

As a result of the study of oblique inguinal hernia as related to accident and compensation, a review of the literature seems to show a general division of hernia into the following types:

Hernia by direct external violence, the true traumatic hernia. These cases, though very rare, do occur. The external force is that caused by a more or less sharp body which produces considerable subcutaneous laceration of tissues. In connection with traumatic hernia by direct violence it is claimed by authorities that it should be remembered that localized blows, however violent to other parts of the abdomen, never yet have produced and never will produce inguinal hernia. Widespread contusion of the abdomen may rarely cause inguinal hernia.

Patterson, as chief of the Division of Industrial Hygiene and Engineering, Pennsylvania Department of Labor and Industry, has had unusual facilities for broad observation of this question and has published a very able article. He has given a very interesting review showing the attitude of various compensation boards on the question of hernia, clearly showing how different their views and rulings are. His own opinion is that hernia in practically every case, except in those very rare cases where a traumatism causes a break in the abdominal wall, is the result of a prenatal, anatomical defect and should be classed as a disease and not as an accident. Patterson considers that all cases will be considered as either congenital or of slow development and not compensable, being a disease rather than an accidental injury, unless conclusive proof is offered that the hernia was immediately caused by such sudden effort or severe strain that:

1. Immediate descent of the hernia followed the alleged causative injury or strain.
2. There was severe pain in the hernial region.
3. There was such prostration that the employe was compelled to cease work immediately.
4. The above symptoms were of such severity that the same were noticed by the claimant and communicated it to the employer within twenty-four hours after the occurrence.
5. There was such physical pain that the attendance of a licensed physician was required within twenty-five hours after the occurrence of the hernia.
6. The trauma or strain must be adequate.

Where two or more of the criteria are lacking, it is claimed a case cannot be justly maintained to be one of traumatic origin. In the true traumatic hernia all six of Patterson's criteria of the typical compensable hernia will be present, more particularly since such a force must produce considerable subcutaneous laceration of the tissues.

Admitting, then, that all true traumatic hernias, though rare, are compensable, there is another class that is taken up under Caption No. II, called Hernias of Effort or the French hernia of force. These hernias are of two types. Type 1, a hernia alleged to be due to muscular effort and appearing suddenly and immediately under adequate and convincing circumstances, is occasionally met. If a man can reasonably establish that he had no hernia before a certain episode; if this episode was accompanied by a sufficient effort to make possible the stretching and tearing of muscles in parts previously intact; if the immediate results are such that any medical man who has had the matter explained to him must realize that it would have to be the cause; that is, if the other five criteria of Patterson are present along with the adequate force just mentioned—then a compensable hernia has been produced. Type 2 of these hernias of effort are hernias that are alleged to be due to muscular strain and to appear gradually and shortly after trivial effort and under inadequate and convincing circumstances. This type of hernias form the greatest number of claims for compensation for hernia that are made, because they form by far the largest percentage of all hernias—possibly 90 per cent. They are responsible for the greatest number of contests before the industrial boards and courts. Employes with this type of hernia are, however, exactly those in whom there is always a congenital sac. The hernia has been forming slowly for months or years. The process has been painless. The claimant has been quite unaware that it was going on. The most trivial muscular efforts at work, at play, or at home, physiologic functions, such as coughing, sneezing, strains, defecation, or micturition have all been helping over a long time gradually and painlessly to dilate the internal ring, spread open the persistent process and force intestine or omentum into the congenital sac. The hernia has, in all probability, already been present for some time before the trivial incident calls the man's attention to his groin.

The last strain is not the cause of the man's having a hernia any more than any other of the countless strains that perhaps ever since birth have gradually been helping to produce the final result. As Morehead has well said, it is no more logical to hold this final strain to be the cause of the hernia that has been slowly developing for months than it is to consider the last expulsive effort of a woman in labor to be the cause of another human infant being born. The last labor pain is no more the cause of a baby than a thousand other incidents of the past nine months. Another illustration more directly apropos is the following: Someone has told of a young foreigner who, to avoid military service, provided himself with a stick which at frequent intervals he placed across his groin and struck with a hammer. After long perseverance he finally produced double direct inguinal hernia. The last blow of the hammer was not the cause of the hernia, any more than was the first or any one of the intermediate ones. Yet, if, instead of the last self-inflicted blow, he had received an accidental blow of a hammer at work, he would ask, and in many states receive, compensation. In other words, compensation boards would hold that it was the last blow of the hammer which caused the hernia. The practical phase of these slowly developing hernias is this: In persons with a persistent funicular process, hernia is going to occur; the hernia will come anyway, work or no work.

In this group of hernias, Type 2 of the hernias of effort, over which there is so much dispute as to whether they are compensable or not—

1. The six criteria of Patterson of a true compensable hernia are conspicuously absent.
2. In the vast majority of cases the hernia has already been present and the alleged injury only calls attention to it.
3. If the alleged injury really did force viscera into the waiting sac, it has simply produced a further stage in a naturally progressing process and has in no way created a new condition demanding compensation for the final product.
4. Similarly, if an old hernia is made larger by a strain at work, it creates no new condition demanding compensation for the final product.
5. Any result to receive any consideration at all must be immediately present.

I think we will agree as to the fairness of Wainwright when he says: "I feel as much as anyone that a person with a hernia justly caused by work

should be compensated. Also, I am just as glad as anyone to see assistance given to disabled employes. I believe, however, that the employer should be protected from fraud. He should not be made to pay for an old hernia and he should not be made to pay for a hernia that was not actually caused by work, nor in the gradually developing hernias should he be compelled to purchase the final product because the job happens to be finished while the man is in his employ. In fairness to all, a law that involves a scientific medical question should be determined in accordance with the best scientific medical knowledge on that question."

Dr. Coley of New York, who has had such an immense experience in hernias in the Hospital for the Ruptured and Crippled in New York City, about five thousand a year, in speaking of this classification of hernias into the true traumatic type which are all compensable and the hernias of effort, Type 1 of which is considered compensable and Type 2 of which furnishes a great field of debate as to their compensability, says:

"Personally, I would prefer to divide hernias into two classes—traumatic hernia as above described due to a violence resulting in laceration and perforation of the abdominal wall, and the second class to include all other cases."

He says the larger one's experience with hernia, not only from the clinical but operative standpoint, the more strongly does he become convinced that the underlying cause of hernia is practically always the presence of a pre-formed, unobliterated sac extending for a longer or shorter distance down the inguinal canal, a potential hernia. The second important consideration is that an actual hernia practically never occurs as the result of a single fall, blow or slipping or any of the ordinary causes attributed to hernia, nor does it occur from a single increase in intra-abdominal pressure, no matter how great. Anyone of these causative factors received innumerable times gradually dilates the pouch until it attains such size that any little force of some sort or other causes it to dilate sufficiently to make some of the intestine or omentum enter it, a portion large enough to be detected by palpation or inspection.

In connection with this I would like to bring attention to the matter of the single strain or force. The medical witness testifying before the commission is often asked by the attorney whether or not a single force or strain may not cause an indirect

inguinal hernia. Especially is one apt to be asked this question when he has testified to the effect that a hernia is first caused primarily by the pre-formed sac and secondarily by strains to which the individual has been subjected throughout all his life and that in the opinion of the medical witness the last strain has not been more important than all the other strains.

This is a question on which the medical witness is apt to be unwilling to express an absolutely positive opinion. Apparently Dr. Coley is quite positive that a single strain or force or increase in the intra-abdominal pressure will not produce a hernia and he states further in this connection that it is a very important question and one that has given rise to much dispute in a medico-legal way. He quotes MacCready, the greatest English authority on hernias, as saying that hernia is never due to this cause, and also quotes Gräser, one of the highest German authorities, as saying that a hernia complete in all its parts can never arise at the moment of accident or by a single increase in the intra-abdominal tension, be it ever so great.

When one is confronted with a hernia, the history of the alleged injury is most important. The examining surgeon should learn first the nature of the man's usual work and usual muscular effort. He then should determine as exactly as possible the nature of the force—what was the weight; how many were carrying; did others let go; was there a severe effort to maintain equilibrium after a stumble or slip; what was the attitude at the moment of the force (strain with legs apart and the body bent forward is said to be the most conducive to the development of hernia). Inquiry should next determine the immediate results—what was the character of the pain; was it immediate; how long did it last; were there other symptoms, vomiting, collapse, etc.; was work interrupted and for how long; when was the swelling first noticed; what physical description does the claimant give of it? The examining physician should further be furnished with whatever evidence there may be from bystanders, co-employes and any physicians that may have seen the claimant before he did. Searching inquiry should be made as to the possibility of hernia in childhood and into the previous industrial history—what is the duration of the present work; has there been a recent change from a sedentary to a laborious occupation? Thus it will be seen that the preliminary inquiry should

of itself almost determine the judgment. It should develop completely how far the six criteria mentioned by Patterson and quoted above are established. Every bit of evidence which can be collected must be carefully weighed before deciding whether the hernia is due to natural causes making it non-compensable, or whether it is due to unnatural causes and therefore compensable.

Mock, and other authorities, state that in favor of the hernia being due to natural causes we have the following:

1. History or knowledge of a hernia already existing. This implies at once the necessity of thoroughly examining all applicants for work and all old employes and carefully recording the presence or absence of hernia.

2. History of hernia in childhood which was apparently cured by the truss and has not been present for several years.

3. Presence of hernia at some other abdominal orifice showing a tendency toward this condition.

4. Weakness of the structures forming the walls of the inguinal canal.

5. A family history of hernias is a strong etiologic factor in favor of the employe being congenitally predisposed to the condition.

6. The age of the patient is an important factor in determining the natural or unnatural cause of the hernia.

7. Other etiologic factors such as recent debilitating diseases, bronchitis, prolonged constipation, faulty posture, visceroptosis, etc.

8. Certain conditions during examination of the hernia which indicate that it was due to natural causes; for example, a large hernia indicates its pre-existence. Discoloration or deep depression of the skin over the hernia indicates that a truss has been worn and therefore a hernia must have existed.

In favor of the hernia being due to unnatural causes and therefore compensable, we have the following:

1. Definite proof that the hernia did not exist previously. This is not always easy to obtain unless there are records of examination of employes, as one can not depend upon the testimony of the individual. Even though he may be ever so honest, he may be mistaken. Coley states in his large experience of some five thousand hernias a year at the Hospital of the Ruptured and Crippled in New

York City that very frequently people come to them who have a hernia and do not know it.

2. A definite history of an accident occurring coincidentally with straining or a severe effort, far in excess of that which the man's muscular development, stature, or past experience in the occupation should call for. Such factors would compose the unnatural occupational hazards as opposed to the natural strains of his ordinary work.

3. The appearance of a hernia immediately or very shortly after the occurrence of one of these unnatural exciting causes. The sudden appearance is usually evidenced by the employe complaining of pain, reporting the condition to one or more fellow-employes, and seeking medical attention very shortly afterward.

The authorities generally agree that the final decision as to whether a hernia is compensable or not must often depend on the findings at the operation. All who have been on the witness stand as medical witnesses before the referee know that one will be asked by attorneys and referees as to the condition of the sac at operation. Wainwright puts it very well when he says: "The operative findings will frequently definitely decide in the case of a hernia as to whether the hernia is an old or a new one." One error, however, that is frequently made is to consider that a small, thin, non-adherent empty sac is necessarily a recent one. The fact is that this kind of a sac is the typical persistent funicular process. Its length depends on how far the obliterative process has been completed but otherwise it may be as thin and delicate as it was at the time of birth. It remains so if not interfered with until old age. It is only the presence of hernial contents which develops thickening, adhesions, and the other appearances which we ordinarily associate with an old hernia. The changes which we ordinarily accept as indicating long standing have begun only when abdominal contents have been forced into these delicate structures and have set up irritation. The longer the delicate type of sac, the more certain it is to be congenital. If adherent to the tunical vaginalis or connected with it by a fibrous band, it is certainly a congenital sac. In the presence of this type of sac, unless there are other signs, it may be impossible to form any idea as to how long ago it began to harbor from time to time some of the abdominal contents; that is, we can be quite sure that the sac is congenital, but we can form no idea as to how long ago a real

hernia began. No matter whether the sac is a mere dimple at the internal ring or a complete failure of obliteration or anything between the two, there will be no pathologic changes until abdominal contents are driven in and cause irritation. When the sac is thickened and adherent to the surrounding tissues, we know that the hernia itself is an old one, the age depending in general upon the degree of thickening. Adherent intestines and omentum, chronically congested or inflamed omentum, especially if adherent down to the bottom of the sac with itself adherent to the tunical vaginalis, prove hernias of long standing, at least several years.

In most unusual circumstances, extravasation of blood and other signs of acute trauma will be present and will probably indicate a true traumatic hernia. Strong muscle structures making up the canal and ring may still be present long after the first appearance of a hernia, especially if it was not large and if the contents are only occasionally down. Weak, atrophied muscles with large lax rings, especially with the pillars of the external oblique stretched and poorly identified, are secondary developments due to the long continued stretching of large hernial contents and always indicate old hernias. This evidence thus obtained at operation should be carefully noted, as it may be of great benefit in determining whether a hernia is compensable or noncompensable.

Mock says, Industrial Commissions all over the country are depending on the surgeons in industry to arrive at a just and equitable decision concerning this subject of compensable hernia. The first essential is to make a careful physical examination of all employes and to record those that have real or potential hernias. Whenever a hernia develops in one of those employes who was recorded not to have a hernia, a careful analysis of his case must be made to determine:

1. Was it entirely due to pre-existing defect.
2. Was it entirely due to some severe direct or indirect violence.
3. Was a latent condition already present and only aggravated by the unnatural occupational hazard.
4. Was it due entirely to natural causes.
5. Or was it due to a combination of all these and, if so, which was the most responsible.

Every surgeon must then keep a careful record of his methods of determining these points. When-

ever one of these hernias is operated a careful description of the condition of the sac and the contents must be made with a view of determining which are the recently formed hernias and which are old. From these records it will be possible to standardize definite methods of justly deciding which are compensable hernias.

Medical literature on this phase of hernia, covering American, French, English and German literature, is rather convincing in that every writer has agreed more or less in complete detail to the effect that the large percentage of indirect inguinal hernias are not due primarily to accident or injury, but to the pre-formed sac. Among prominent American surgeons so writing are C. H. Mayo, Arthur Dean Bevan, Willys Andrews, Wm. B. Coley and many others. Due to the testimony of eminent surgeons who have had large experience, state industrial commissions are declining more than formerly to recognize hernias as compensable accidents. In a memorandum in the Workman's Compensation Decisions of the State of Minnesota, the rules of the Minnesota State Commission, I am informed, are quite well set forth. I quote as follows from the memorandum:

"Hernia claims have always been troublesome in connection with the compensation act; and their adjustment probably always will be accompanied with a great deal of doubt and uncertainty. The compensation laws of a number of the states provide definitely that in order to be entitled to compensation for hernia a workman must prove clearly seven things:

1. That the hernia is of recent origin.
2. That its appearance was accompanied by pain.
3. That it was immediately preceded by some accidental strains suffered in the course of the employment.
4. That it did not exist prior to the date of the alleged injury.
5. That it was accompanied by immediate total disability.
6. That immediate medical treatment was necessary, and
7. That the employer was notified within a short period of time after the alleged injury."

In view of all this discussion on the compensability of hernia, it behooves us as physicians when we come in contact with any cases of hernia which are apt to bring up medico-legal questions and

come before the industrial commissions and courts for trial that we study very carefully all the facts in the case and that we keep a careful record of these facts so that when we go on the witness stand, as medical experts, we may be more fully and perfectly prepared to answer all questions that may be propounded to us by the referee and the counsel for the plaintiff and the counsel for the defense to the end that our testimony may be truly scientific and in accord with established medical facts and to the end that we may thus give a fair, honest, unbiased and scientific medical opinion, and to the further end that justice may be done to both the employer and the employee.

DIGESTIVE ENZYME THERAPY ON THE WANE

Not so very many years ago, many physicians would have considered it a handicap to be deprived of the use of digestive enzymes in their daily prescribing. Even the most conscientious, while resisting the alluring color and pleasing taste of a widely advertised elixir claimed to contain pepsin, pancreatin and diastase, nevertheless gave pepsin in certain conditions, diastase in others and in cases of supposed pancreatin deficiency, pancreatin in the hope that the latter would safely reach its destination and have some action. Today a vast majority of clinicians make little or no use of digestive enzymes. The report of W. A. Bastedo on the use and utility of digestive enzymes summarizes the replies to a questionnaire submitted at the request of the Council on Pharmacy and Chemistry to the members of the American Gastroenterological Association and brings out forcibly that gastric ferments are considered of minor importance in therapeutics. The report fully justifies the estimate of the Council on Pharmacy and Chemistry which states in the chapter on digestive enzymes in *New and Non-official Remedies* that the utility or need for the internal administration of digestive enzymes is problematic. The Bastedo report is additional evidence of the untiring efforts of the Council to supply the medical profession with up-to-date and impartial information in regard to the actions and value of drugs.

(*Jour. A. M. A., Sept. 19, 1925, p. 905.*)

BICHLORIDOL AND SALICIDOL NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that "Bichloridol" and "Salicidol" are the proprietary, uninforming names applied to suspensions, respectively, of mercuric chlorid and mercuric salicylate intended for intramuscular administration. These preparations are manufactured by the Collapsule Co., Inc., New York, and marketed by the H. A. Metz Laboratories, Inc., New York. The Council found "Bichloridol" and "Salicidol" inadmissible to *New and Non-official Remedies* because they are marketed with indefinite statements of composition and under nondescriptive, proprietary names.

(*Jour. A. M. A., Sept. 5, 1925, p. 764.*)

THE GRADING OF CARCINOMA*

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In the past the physician was content with a simple diagnosis of cancer, but he has now reached a point in his knowledge of the disease where such diagnosis is not entirely satisfactory, because cancers vary in their gross and microscopic appearance, and also in their effect on the human body. The physician and the layman not only want to know the type of cancer they are dealing with, but also its grade of malignancy, since the grading has a very important bearing on prognosis and treatment. Cancers have been classified largely according to gross form, density, duration and cause. This practice brought out such descriptive terms as papillary, infiltrating, ulcerating, napkin-ring, cystic, colloid, encephaloid, scirrhus, fulminating, buyo-cheek, chimney-sweeps', kangri, paraffin, pitch-workers', smokers', and tar.

From a practical standpoint, carcinomas fall into two general groups, those arising from the regenerative cells of protective epithelium, such as the skin, lining of the mouth, urinary bladder, and vagina, known as epitheliomas or epidermoid carcinomas, and those arising from the regenerative cells of gland or secretory epithelium, such as are found in the gastro-intestinal tract, gallbladder, breast, prostate and thyroid gland, known as adenocarcinomas.

The first group can be divided into squamous-cell epithelioma, which represents about 80 per cent of all epitheliomas; basal-cell epithelioma; melanotic epithelioma; nonmelanotic melanotic epithelioma, or the white blackberry type of melanotic epithelioma; adamantine epithelioma, or adamantinoma; and mixed epithelioma. These epitheliomas, to a great extent, are named according to the way their cells tend to differentiate. Squamous-cell epitheliomas have a tendency to differentiate into squamous cells; basal cell epitheliomas have a tendency to differentiate into cells that closely resemble normal basal cells. Melanotic epitheliomas have a tendency to differentiate into melanin-producing cells. Nonmelanotic melanotic epitheliomas belong to the melanotic epithelioma family,

*Read before the Minnesota State Medical Association, Minneapolis, April 27-29, 1925.

but they do not produce melanin. They have the same cell appearance as the nonpigmented areas of melano-epitheliomas, and it is reasonable to believe that, should their cells differentiate far enough, melanin would be produced. It is believed that the adamantinoma arises from the enamel organ and that its cells differentiate into a sort of adamantine substance, but they usually degenerate and form cysts before reaching this stage.

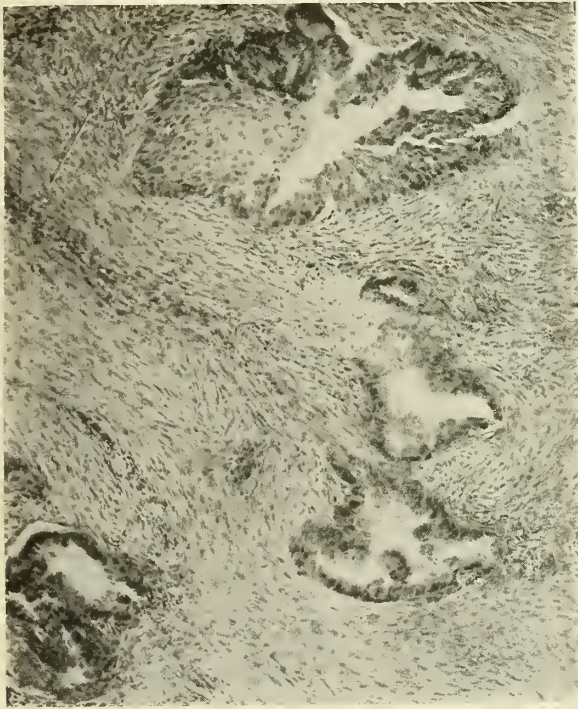


Fig. 1. Carcinoma of the gallbladder. Both squamous and gland epithelium are shown in the same acinus.

I have been able to trace the origin of three of these neoplasms from the epithelium of the gum, which leads me to believe that more of them might be found to have such an origin if discovered early. The adamantinoma appears to be more closely related to the squamous-cell epithelioma than to any other type.

The cells of a mixed epithelioma, or carcinoma, have a tendency to differentiate into both a glandular and a protective type of epithelium. Cancers that arise from the regenerative cells of gland or secretory epithelium should be termed adenocarcinoma, or gland carcinoma, because whenever differentiation takes place it is usually toward a gland or secretory type of epithelium. Mucoid or colloid carcinoma is an adenocarcinoma with a tendency

to differentiate to the extent that a mucus-like substance is produced. A scirrhous carcinoma is an adenocarcinoma that is meeting with marked resistance on the part of the host, as manifested by an excessive amount of fibrous tissue that is thrown around the carcinoma cells.

A certain type of carcinoma is sometimes seen growing in the location of another, such as a squamous-cell epithelioma of the gallbladder or



Fig. 2. Adenocarcinoma of cecum, graded 2. Bone is intimately associated with the growth.

stomach, or an adenocarcinoma that has originated from the regenerative cells of the epidermis; or a squamous-cell epithelioma and an adenocarcinoma may be found in the same neoplasm. In certain cancers of the gallbladder, part of the neoplasm is made up of squamous-cell epithelioma and part of adenocarcinoma. I have seen a carcinomatous acinus in which one side is squamous epithelium and the other side gland epithelium (Fig. 1). In this case the regenerative cells had an inherent capacity to produce both a gland type and a squamous or protective type of cell. No confusion need be caused by the appearance of squamous epithelium in a neoplasm of a tissue that normally contains no such epithelium. It is not necessary to assume the presence of misplaced squamous epi-

thelium or cell rests. The endometrium of the everted uterus responds to the need for protection by producing squamous epithelium, showing that the regenerative cells of the endometrium are capable of producing either gland epithelium or squamous epithelium, according to the use to which the tissue is to be put. In this adjustment to changed environment, as in the variations of malignant cells in the gallbladder, the process is one of cell evolution, not one of cell confusion. Gland structures such as the breast, and sweat and sebaceous glands, develop from the regenerative cells of the skin. If gland structures develop from the regenerative cells of protective epithelium, and protective epithelium from the regenerative cells of gland structures either normally or under nonmalignant conditions, why should not a similar condition be seen in carcinoma, since it is the product of epithelial cells?

Not only are there combinations of adenocarcinoma and epithelioma in one neoplasm, but there is more than one type of epithelioma.

The so-called mixed tumor of the parotid is a slow growing adenocarcinoma that has cartilage and sometimes bone around its cells for protective purposes. I have seen an adenocarcinoma of the cecum with bone associated with it (Fig. 2). This bone is in the neoplasm, but not of it. Its presence is purely defensive on the part of the host, just as the presence of fibrous connective tissue. Cartilage and bone are often found in tonsils that show chronic inflammation. If one of these tonsils had an epithelioma along with the cartilage and bone, it would not be right to speak of it as a mixed tumor.

It is possible that true teratomas spring from cells of a fairly wide totipotency. The more undifferentiated a cell, the greater is its totipotency. The fertilized ovum is the most totipotent of all cells, because from it the whole organism is developed by the process of differentiation.

In a recent article I have endeavored to point out how a number of carcinomas, by the process of differentiation, put the brakes on themselves, so to speak (Fig. 3). Squamous-cell epitheliomas control themselves by differentiating into keratin, which, when found in circumscribed masses, are called pearly bodies, and into cells which, if they do not contain keratin, have differentiated beyond their ability to reproduce, such as the large, flat squamous cells.

Basal-cell epitheliomas control themselves by producing cells similar to the normal basal cells of the skin, and melano-epitheliomas by producing melanin, which is a product of the epithelial cells and indicates an attempt at self-control.

Adenocarcinomas control themselves by differentiating into gland or gland-like structures, sometimes with the production of colloid, mucus, or a mucoid or pseudo-mucinous material. Primary carcinoma of the liver has been known to produce bile.

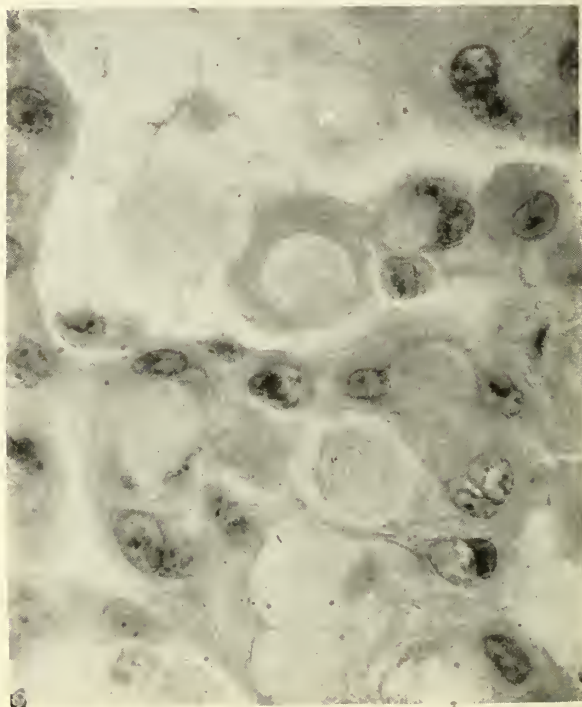


Fig. 3. Squamous-cell epithelioma of the skin. A number of cells are shown differentiating into keratin.

It is quite obvious that a carcinoma whose cells increase by geometric progression, without differentiation beyond the point of reproduction, would grow faster and be more malignant than one that caused a number of its cells to differentiate beyond the point of reproduction. If there is such a thing as spontaneous cure of carcinoma, it is probably caused by complete differentiation of all of its cells, or differentiation beyond the point of reproduction.

The so-called scirrhous carcinoma is usually highly malignant; it meets a high grade of resistance, but the carcinoma usually wins. Some carcinomas are a type of natural-born fighters, and the more resistance they encounter the harder they

fight, which is evidenced by cells of the carcinoma of the so-called leather-bottle stomach that becomes so undifferentiated it is difficult, in some instances, to know whether one is dealing with carcinoma or sarcoma. But these highly undifferentiated cells will often show their colors by attempting to form acini when they reach an area where they meet less resistance.

In 1915, I began grading malignant neoplasms on the basis of cell differentiation, and during the

growth, it is graded 3, and if there is no tendency of the cells to differentiate, it is graded 4. Of course, the number of mitotic figures and the number of cells with single, large, deeply staining nucleoli (one-eyed cells) play an important part in the grading." The mitotic figures and the one-eyed cells are undifferentiated calls, and really should be considered only as such; however, when mitotic figures are numerous, especially if they are irregular, one is inclined to raise the grade slightly.



Fig. 4. Squamous-cell epithelioma of the lip, graded 1. Marked differentiation is shown.



Fig. 5. Adenocarcinoma of the sigmoid, graded 3.

following four years 2,000 epitheliomas were intensively studied. Of this number, 1,628 squamous-cell epitheliomas were graded strictly from a microscopic standpoint, quite independent of the clinical histories, on a scale of 1 to 4, as follows: 146 (8.96 per cent) grade 1; 788 (48.40 per cent) grade 2; 508 (31.20 per cent) grade 3, and 186 (11.42 per cent) grade 4. The basis of the grading, published in 1920, is as follows: "If an epithelioma shows a marked tendency to differentiate, that is, if about three-fourths of its structure is differentiated epithelium, and one-fourth undifferentiated, it is graded 1; if the the differentiated and undifferentiated epithelium are about equal, it is graded 2; if the undifferentiated epithelium forms about three-fourths and the differentiated about one-fourth of the

After nine years of experience with the grading of epitheliomas, I believe that the system of grading should be slightly revised; that is, instead of a grade 1, in which about three-fourths of the cells are differentiated and one fourth undifferentiated, should be substituted grade 1, in which differentiation or self-control ranges from almost 100 to 75 per cent, and undifferentiation from 0 to 25 per cent (Fig. 4). Grade 2 should represent a carcinoma in which differentiation or self-control ranges from 75 to 50 per cent, and undifferentiation from 25 to 50 per cent (Fig. 2). Grade 3 represents carcinoma in which differentiation or self-control ranges from 50 to 25 per cent, and undifferentiation from 50 to 75 per cent (Fig. 5). Grade 4 represents carcinoma in which differentiation or self-

control ranges from 25 per cent to practically 0, and undifferentiation from 75 to about 100 per cent (Fig. 6). So far as an estimation of the ultimate result is concerned, this revision will have no effect on grades 1 and 2, but will affect slightly grades 3 and 4. In other words, the most malignant of the grade 3 neoplasms will be classified in grade 4.

Up to November 1, 1924, after excluding the inoperable cases and the cases in which death occurred immediately after operation, complete data were obtained in 830 cases of graded epitheliomas:

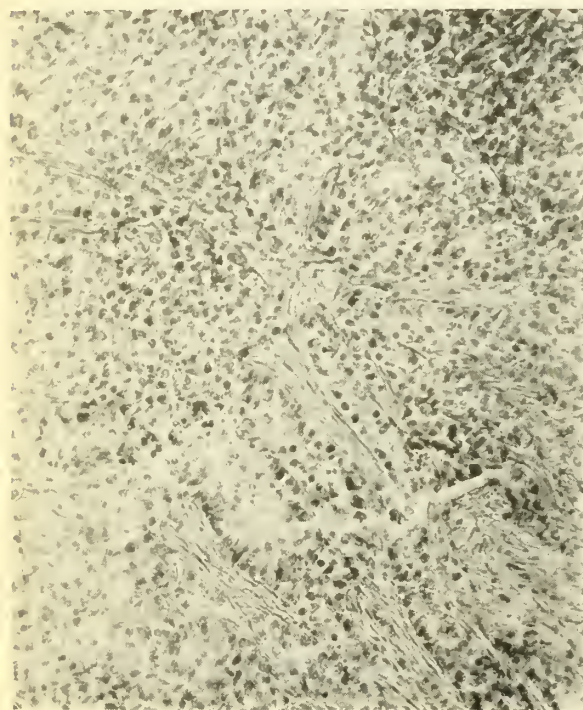


Fig. 6. Adenocarcinoma of the stomach, graded 4.

82 (9.31 per cent) were of grade 1; 407 (46.25 per cent) were of grade 2; 282 (32.04 per cent) were of grade 3; and 109 (12.38 per cent) were of grade 4.

In the first group, good results were obtained in 90.20 per cent; in the second group, good results were obtained in 62.16 per cent; in the third group, good results were obtained in 24.82 per cent, and in the fourth group, good results were obtained in only 10.09 per cent.

MALIGNANT TUMORS OF THE THYMUS: WITH REPORT OF A CASE*

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Not a great many cases of malignancy of the thymus have been described. Schridde¹ says, "With the exception of bone marrow, the thymus is the organ in the body poorest in tumors." In 1896 Hoffman² collected thirty-five cases. Rubaschow³ in 1911 added thirty-six more. Since then, twenty-three cases have been reported.⁴⁻²⁴ In 1917 Dr. Bell, of the University of Minnesota,¹³ reviewed seventy-three cases "grouped by the several authors as follows: 27 lymphosarcoma, 3 round cell sarcoma, 2 fibrosarcoma, 19 other varieties of sarcoma and sarcoma without special designation, 10 carcinoma, 6 thymoma, 1 fibroma, 5 miscellaneous."

Anatomy.—The reticulum of the thymus is formed from the infolding epithelial tubes from the third branchial clefts (Stohr²⁵). These clefts meet in the midline, the lumen is lost and the cells proliferate. On this all of the authorities agree. The origin of the parenchyma cells, however, is a matter of debate. These cells have the appearance of small lymphocytes, and cannot be distinguished from lymphocytes. If they are true lymphocytes, then they must arise from the mesoderm and infiltrate the reticulum of epithelial origin. All other lymphoid organs are supposed to be formed in this way (Hammar,²⁶ Wiesel,²⁷ Maximow²⁸). Ewing²⁹ states that the parenchyma cells have not been successfully distinguished from lymphocytes by many studies directed to their morphology, microchemical reactions, serological relations or behavior in most pathological conditions.

However, the thymus as a whole never looks like a lymphoid organ, though some of the individual cells do so appear. Its function is evidently different from lymphoid organs and as Hart³⁰ points out, in many systemic diseases that involve lymphoid tissue, the thymus does not become involved.

The other view of the origin of these parenchymic cells is that they develop from the cells forming the reticulum (Pappenheimer,³¹ Prenant,³² Stohr³³). Bell³⁴ has described transition forms between the reticulum cells and thymic cells. In

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, April, 1925.

additional support of this view, there is no authoritative description of the invasion of lymphocytes; also the cells are present in the thymus very early (Ewing²⁹).

Because of the difficulty in understanding the origin of these parenchymic cells, the tumors that have arisen from them have been variously named. If these cells are lymphocytes, then the terms lymphosarcoma and sarcoma and small round-cell sarcoma are permissible. On the other hand, as Simmonds⁴ first pointed out, if they are epithelial in origin, they cannot be sarcomas and must be called carcinomas or epitheliomas.

Granting the epithelial origin of the tumors arising from the so-called lymph cells, the term epithelioma for them would be objectionable, because morphologically they appear like sarcomas. Adami³⁵ points out that it is obvious the terms carcinoma and sarcoma must be given a purely morphological significance. Moreover, there is a group of tumors arising from the reticulum. This tumor is distinctly an epithelioma, morphologically. Six authoritative cases of this tumor have been reported (Symmers and Vance,¹⁷ Foot and Harrington,²² Jacobson²⁰). The concept of this tumor has a sound embryological basis (Jacobson²⁰).

The term thymoma for tumors of the thymus was first suggested by Grandhomme in 1910 (Crotti³⁶). This word has the advantage of being accurate whether the cells are derived from the endoderm or mesoderm. It also clearly associates the tumor with its place of origin. Non-malignant tumors are also included in this term (Bell¹³). To distinguish the distinctly different tumors arising in the thymus a word descriptive of the morphological type should be added: sarcomatous thymomas for those arising from the parenchyma and resembling small round-cell sarcoma, and carcinomatous thymomas for those arising from the reticulum and resembling epitheliomas.

Etiology.—The sarcomatous thymomas outnumber the carcinomatous thymomas by a considerable margin. The literature would indicate that there are about ten of the former to one of the latter. The carcinomatous thymomas all have occurred in patients over fifty, while the sarcomatous thymomas usually appear in individuals under thirty-five years of age. Many of them have occurred in children.

Symptoms.—The first symptom of a thymic tumor is usually cough. Early, too, there is difficulty in breathing. These two symptoms being pronounced in tuberculosis, many cases have been so diagnosed at the onset of the illness. Janeway¹⁶ reports three such cases that later he treated with radium for thymic tumors. The differential diagnosis is absence of physical signs in the apices and increased dullness under the sternum. The dyspnea may be marked, in which case it is relatively easy to diagnose the tumor. In some cases there is difficulty in swallowing and sense of pressure in the mediastinal space. The course of the sarcomatous thymomas may be rapid, death occurring from one to four months after onset of the first symptoms. The carcinomatous thymomas, on the other hand, are more slow in developing. As the disease progresses, the dyspnea becomes extreme, the tumor infiltrates into lungs and pleura and the vessels become compressed, causing venous congestion and cyanosis of the head and neck.

Frequently there are metastases into the cervical lymph nodes on one or both sides. In some cases axillary lymph nodes have been involved. There may be metastases in the liver and kidney, but these are seldom so extensive as to be important factors in the case. It is rare that extensive metastases occur, and in no case previously have metastases in the skin been reported. For that reason the report of the following case is important:

REPORT OF CASE

H. O., aged 23, married, an elevator operator, was first seen in the Out-Patient Department November 10, 1921, complaining of cough and sore throat. At that time the physical examination was essentially negative. By November 27 there was slight swelling of the cervical glands on the left side of the neck. The patient was weak, however, out of proportion to his physical findings. He was brought to the hospital November 30 in great distress. The leading symptoms were difficulty in breathing, difficulty in swallowing, nausea, and profuse sweating. The patient had pain in his knees and ankles. He could not sleep and complained of being restless.

Physical examination revealed slightly labored breathing and slight cyanosis. He kept up continued purposeless movements of his extremities. On the left side of his neck the glands were enlarged and confluent. The skin over the glands was slightly reddened. They were tender to the touch. There was bronchovesicular breath sounds and moist râles at both bases posteriorly. A friction rub was present.

Blood cultures were negative, Wassermann was negative. His white count was 11,400 with 80 per cent polymorpho-

nuclear. Urine showed slight amount of albumin present. The patient's temperature in the afternoons was between 101 and 104.

X-ray examination of the patient's chest on December 2 did not reveal anything that would cause the symptoms.

On December 7 there appeared a small rose-colored eruption on the abdomen. These were macular and cleared on pressure.

On December 10 his sputum was blood streaked. His respiration rate was increased and there was precordial pain. The patient was delirious, large doses of morphine being required to induce sleep. The skin eruption had spread over the entire body, being present even on the palms and soles. They had a shot-like feel and were closely spaced, but were not confluent. A diagnosis of smallpox was made. As the lung symptoms were so pronounced, it was thought this was a case of visceral smallpox. An x-ray examination revealed numerous small areas of diminished illumination. The lung picture was similar to the one seen in milary tuberculosis.

From this time on the patient became gradually worse. Delirium increased and the patient was boisterous until the last few hours.

Dr. E. T. Bell, of the Department of Pathology of the University of Minnesota, performed the necropsy on this patient and rendered the following report: To him the diagnosis in this case is to be credited.

NECROPSY

"The body is well developed, poorly nourished, length 183 cm., estimated weight 150 lbs. . . . There is an eruption over the greater part of the body; a few lesions on the soles of the feet—and on the left palm; the eruption is most abundant on the upper lateral anterior portions of the chest, forehead and chin; there are a few lesions on the hairy scalp and they are scattered over the entire posterior aspect of the trunk; a few on the extremities. Most of the lesions are discrete and of the macular type. A number are pustules, which, however, seem to be in the stage of desiccation for the most part. Vaccination scar on the left forearm. . . .

"There are numerous soft adhesions over both lungs. The pericardial cavity contains no excess fluid; no adhesions. . . . There is no disease of the valves or of the mural endocardium.

Both lungs are expanded and very heavy. The right weighs 1,350 grams. Crepitation is greatly reduced everywhere, especially in the posterior portions. There are large numbers of small nodules distributed throughout the entire substance of the lungs. These are seen under the pleura as well as over the cut surfaces. The nodules vary in size from a pinpoint to 6 or 8 mm. in diameter; they are firm, of whitish appearance and rather sharply outlined. The lung tissue between the nodules contains air and abundant fluid. No caseous areas are found. There is no pus except in one small bronchus near the hilus. The left lung weighs 1,200 grams and resembles the right in all respects except that the nodules are not quite so numerous. The bronchial lymph nodes are enlarged and softened. No caseous areas or calcified areas are found.

"The thymus, or a mass in the position of the thymus, is enlarged and very firm; measures 10 cm. vertically and

6 cm. transversely. Section of this structure shows soft whitish tissue, a part of which has a lobular arrangement. No caseous areas. . . .

"The left cervical lymph nodes are greatly enlarged and partly fused together. A mass of these is dissected out. The nodes are softened. Caseous areas found in one node, measuring about 1 cm. in diameter. Other nodes show no caseation or calcified areas. . . .

"Microscopic examination: Cervical lymph nodes enlarged and almost completely replaced by sarcomatous tissue; extensive central necrosis in the nodes. Lung: Metastases of sarcomatous thymoma; some nodules surrounded by inflammatory exudate; some nodules of a pure bronchopneumonia. Thymus: Thymoma of lymphosarcoma type (numerous mitoses). Liver: Metastatic sarcomatous thymoma. Bronchial lymph node: Metastatic sarcomatous thymoma. Kidney: Metastatic sarcomatous thymoma. Lungs and Skin: Numerous metastatic sarcomatous thymomas.

"Diagnosis: Sarcomatous thymoma with numerous metastases in lungs and skin and metastases in left cervical lymph nodes, liver and kidney."

SUMMARY

(a) A case of thymoma is presented with clinical, roentgen ray and pathological reports.

(b) Extensive lung and skin metastases may occur in a case of thymoma.

(c) The term sarcomatous thymoma is preferable to the term lymphosarcoma of the thymus, because:

1. These tumors do not exactly resemble true lymphosarcomas morphologically.
2. The term is equally applicable whether the parenchyma is of epithelial or lymphoid origin.

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DISCUSSION

DR. MOSES BARRON, Minneapolis: I believe that most of us can say that of all the organs in the body we have forgotten least about the thymus than of any other organ. The reason for this is self-evident: We had very little to forget. The confusion as to the function and pathology of this organ is so great that practically no one can say definitely just what its purpose is or to what pathological changes or tumors it may give origin.

It has been found by animal experimentation that the thymus can be removed with very little damage to the animal, and that the results of the experimental extirpation are quite negative. Many cases of Basedow's disease show an enlargement of the thymus that is quite considerable and in about 75 per cent of cases such enlargement is present. There is a condition present in a certain group of individuals which is characterized by general lymphocytic hyperplasia, by hypoplasia of the adrenals and the aorta, and certain other anomalies in the body. This con-

dition is known as status thymico-lymphaticus. The thymus is generally found enlarged in these individuals. Just what the relation is between the thymus and the lymphatic tissue of the body is not very well understood. In a condition known as myasthenia gravis the thymus presents an enlargement in about 90 per cent of the cases, at times being a large bulky mass. The enlargement is considered a simple hyperplasia. There are no authentic cases in which malignant tumors of the organ are associated with this condition.

The nomenclature of thymic tumors is not satisfactory and there is a great deal of disagreement about it. Ewing believes that thymoma would best explain such a tumor. Aschoff, on the other hand, disagrees with him, since the tumor does not reproduce all the elements of the original thymus. A very few of the tumors have shown structures which can be identified as the epithelial elements known as Hassall's corpuscles. Of the two types of cellular elements present in the organ the origin of one of them, the lymphocytes, has caused a great deal of controversy. Some good authorities trace their origin to epithelial cells, while another group has demonstrated an early invasion of migrating lymphocytes into the stroma of the gland. The confusion as to the true origin of the elements of this organ explains the difficulty of determining the origin of the tumors to which it may give rise.

The principal tumor of the thymus structurally resembles Hodgkin's disease, though it is most frequently designated as lymphosarcoma. This type responds readily to roentgen-ray therapy in most cases, while some cases proceed rapidly to a fatal termination. The less malignant forms, such as the simple hyperplasia associated with status thymico-lymphaticus, would also respond well to roentgen-ray treatment.

Fortunately, tumors of the thymus are rare. This is evidenced by the fact that in the Department of Pathology at the University of Minnesota only three cases have been found in over 6,000 autopsies. The case reported this afternoon is the second case showing a malignant tumor of the thymus, and the third case is that reported by Dr. E. T. Bell in a case of myasthenia gravis.

One might go on with this story hour after hour, each chapter more absurd than the other, and yet each of these healers, or systems of healing, has attained therapeutic results with certain patients who have gone from physician to physician without obtaining relief. The "cure" may have come from one believed to have a commission from on high, it may have been poor whiskey with a bitter taste, a punch in a perfectly good vertebra by an ex-sewing-machine agent, a harmless electricless belt, the printer's ink taken with a bottle of swamp-root; it may have been any hook on which to hang a therapeutic hope; but, it may have cured. There is no denying this, for it is true. "Cures" of these types have been working successfully since earliest history. We may laugh at the absurdities recorded; but,

human nature does not change, and our present age does not lag behind in its tendency to be cured by anything and everything that changes the patient's mental attitude toward himself and his ills. People healed in these manners are not limited to any strata in life. They include the rich and the poor, the ignorant and educated; in fact, it is usually the educated mind that is most suggestible. Remember children, half-wits and idiots are never cured in this manner; in fact, the quack has learned to waste no time on them. On the other hand, school teachers, clergymen and college professors are often easy prey, and Walsh names in addition the "high-brows" and defines them as those with more education than intelligence.—Rock Sleyster, Wis. Med. Jour., Dec., 1924.

THE MANAGEMENT OF CASES OF COLLOID GOITER*

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I shall limit myself here to a few considerations in the management of diffuse colloid goiter. In the literature one finds such terms as simple, adolescent, sporadic, endemic and epidemic goiter. In many cases, unfortunately, the pathologic descriptions are vague or entirely lacking, and it is probable that goiters thus classified are diffuse colloid, adenomatous, or combinations of both.

The secreting portion of the thyroid gland is composed of vesicles or acini, the lining of which consists of cuboidal or low columnar epithelium. These vesicles contain, more or less, a deeply staining colloid material and are supported by tissues common to gland structure.

At certain times the thyroid gland is called on to produce an increased amount of its product, thyroxin. This usually occurs during metabolic stress, associated with adolescence, pregnancy and lactation, when, owing to a lack of available iodine in the thyroid gland, there may be a decreased amount of thyroxin available in the tissues; this results in a state of potential or actual hypothyroidism. During these times the thyroid is under stimulation, the blood supply is increased greatly, and an abnormal deposit or storage of colloid material takes place. The foregoing, reduced to its simplest terms, is the mechanism in the formation of diffuse colloid goiter. Plummer's concept of the sequence of events given more in detail is as follows: "An inadequate supply of iodine for the proper functioning of the thyroid, a subnormal delivery of thyroxin to the tissues, a potential or actual hypothyroidism, elevation in intensity and sustenance of thyroid stimulation, diffuse hypertrophy of the thyroid, and, if stimulation is sustained sufficiently long, fatigue of the vesicles, change in the secretory process, disappearance of the diffuse hypertrophy, storage of colloid in excess of the normal amount, diffuse colloid goiter." Also, "The sustained stimulation of the thyroid causing a diffuse hypertrophy or the storage of an abnormal amount of colloid causes the formation of new tissue, adenomatous goiter." Just how

much colloid may be considered normal or abnormal is not definitely known, although storage to the extent of making the thyroid gland easily palpable may be considered abnormal. Overdistention of the alveoli with colloid may cause the epithelial cells to become cuboidal or flat, and in some cases disappear altogether.

The etiology of diffuse colloid goiter has interested medical men for many centuries. Numerous and varied theories as to its cause have been advanced only to be discarded as knowledge of the subject has increased. McCarrison's exhaustive studies on the causation of goiter in the Himalayas, as well as the experiments of Marine and Lenhart, working in the fish hatcheries, would lead us to believe that bacteria play an important part in the etiology. McCarrison concludes that the cause of endemic goiter is a bacterium residing in the intestinal tract of man, and that in some way a toxin is liberated which causes the thyroid to hypertrophy. More recently, however, McCarrison has modified his theories somewhat, and adds to the theory of infection other factors such as: lack of exercise, overcrowding, inappropriate food, and imperfect hygiene.

Marine and Kimball have quite conclusively shown that colloid goiter, and probably adenomatous goiter as well, may be prevented in most cases by the appropriate administration of iodine. Marine has shown that, in normal thyroids, the iodine content varied between 5.5 mg. and 1 mg. for each gram of dried gland, and that where the iodine store was found below 0.1 per cent, hypertrophic changes were the rule. Comparing further the varying degrees of thyroid hyperplasia with the iodine store of such glands, it was found that the iodine store progressively decreased as the degree of hyperplasia increased. Thus in cases of most marked hyperplasia, iodine was absent or present only in traces. Plummer has suggested that lack of iodine and infection may coexist, as the bacterial flora in some way robs the organism of the small amount of iodine contained in food that would otherwise be available to the thyroid for the elaboration of thyroxin. In short, it may be said without further discussion of the predisposing etiologic factors, that in whatever manner deficiency of iodine is brought about, whether by insufficient intake, inadequate assimilation or utilization, it is the chief known cause of the formation of diffuse colloid goiter.

*Read before the Southern Minnesota Medical Association, Owatonna, Minn., May 18, 1925.

Diffuse colloid goiter is found the world over. In some localities, as for example in the mountains of Switzerland and in the Himalayas, it is very prevalent. In general, it is more commonly found in the mountainous regions and inland as compared with the seacoast. In the United States, as is well known, it is found more commonly in the north-west states, in the region of the Great Lakes, and in the valley of the upper Mississippi.

In the United States, a large percentage of diffuse colloid goiters appears between the sixteenth and twentieth years; there is a tendency for the goiter to disappear by the twenty-fifth year, only to reappear during the childbearing periods.

On examining a patient with diffuse colloid goiter, a diffuse, symmetric enlargement of both lobes and the isthmus of the thyroid gland is noted. This enlargement may be barely perceptible, or so large as to be very disfiguring, or by its encroachment on the trachea may cause pressure. Bruits and thrills are often present due to increased blood supply. Often, too, on examination, scattered firm nodules are palpated, which probably indicate the presence of adenomas. The latter may never disappear entirely, although they may vary greatly in size, due to the fluctuation in the quantity of colloid which they contain.

A properly conducted examination is important. In order to palpate the thyroid gland, it is feasible to stand directly in front of the patient, grasp the right lobe with the left hand, the thumb in front, and allow the fingers to sink in from behind the sternocleidomastoid muscle. Pressure may be made with the opposite hand pushing the gland and trachea toward the side palpated. In this manner, the transverse diameter is estimated, and, by instructing the patient to swallow, the gland may frequently be lifted out of the thoracic strait far enough to determine its exact length.

Patients with diffuse colloid goiter do not have symptoms of hyperthyroidism. On the other hand, they have symptoms indicating a mild degree of hypothyroidism, such as dry skin, lack of energy, and decreased tolerance for cold. The basal metabolism is usually normal or below normal. In 329 tests of the basal metabolism made on patients with diffuse colloid goiter at the Mayo Clinic, it was normal or below normal in 87 per cent. Neurotic patients whose attention has been directed to the thyroid by frequent examinations may complain of nervousness, rapid heart, feeling of weak-

ness and lack of strength. That these symptoms are not due to hyperthyroidism may be determined by the finding of a repeatedly normal or subnormal basal metabolic rate.

The differential diagnosis of adenomatous, exophthalmic, and diffuse colloid goiter is important, but should not be difficult. The diagnosis of diffuse colloid goiter and adenomatous goiter is usually readily made by palpation. However, adenomas deeply imbedded in the gland are not always easily palpated, especially if the gland is extremely vascular, and not until the thyroid is reduced in size, either spontaneously or by treatment, can they be ruled out with certainty.

Nervousness, tachycardia, palpitation, weakness, loss of weight, increased appetite, moist hyperemic skin, tremor, increased heat intolerance, and frequently exophthalmos, are the cardinal symptoms and signs of exophthalmic goiter. These factors, taken in conjunction with a persistently increased basal metabolic rate, should be sufficient to lead one to distinguish between the exophthalmic and the diffuse colloid goiter.

That endemic goiter, which includes colloid goiter, adenomatous goiter, and combinations of both types, may, to a large extent, be prevented in man and animals by the oral administration of iodine has been quite definitely proved. This fact is one of the important discoveries of the last decade. Diffuse colloid goiter without adenomas with lateral lobes more than 6 cm. in diameter are relatively rare in the United States; furthermore, adenomas once developed probably never disappear entirely. We know that an adenomatous thyroid not infrequently becomes hyperfunctioning, and, too, that occasionally the administration of iodine to patients with adenomas will initiate hyperthyroidism. Hyperfunction once initiated by the administration of an excess of iodine will continue for years, even though the iodine is discontinued. This factor should be seriously considered in the treatment with iodine of diffuse colloid goiters containing adenomas. Adenomatous goiter frequently becomes a surgical condition.

Iodine in small doses should be given to all individuals during early childhood and adolescence. At what age it should be started and at what age discontinued cannot as yet be definitely stated. It should also be given during the latter months of pregnancy and during lactation. Two grams (30 grains) of sodium iodide may be given in divided

doses over a period of two weeks, this amount to be repeated semi-annually. However, it is preferable to give smaller doses of iodine at weekly intervals throughout the greater portion of each year. A satisfactory, palatable, proprietary product, known as "iodostarin," is on the market. The preparation is in tablet form and contains 10 mg. of sodium iodide; one tablet may be given each week during the school year. Within the last few years many cities have initiated the practice of iodizing the water supply by adding one part of sodium iodide to 100,000,000 parts of water. Several brands of iodized table salt are on the market. These usually contain one part of iodine in 5,000 parts of sodium chloride. Whether or not the person will receive enough iodine to prevent endemic goiter or whether there is enough iodine in the water and salt so treated to initiate hyperthyroidism in persons having adenomatous goiter has not as yet been determined.

Iodine has long been a standard remedy in the treatment of diffuse colloid goiter. However, for several years at the Mayo Clinic the use of thyroxine intravenously, or of desiccated thyroid orally, has largely supplanted iodine in the treatment of this type of goiter. If a patient with diffuse colloid goiter is given from 5 to 10 mg. of thyroxine intravenously, or its equivalent in desiccated thyroid orally, and it is absorbed, the bruits and thrills will disappear in a few hours. During the first twenty-four hours the gland shrinks perceptibly, and if extremely vascular may be reduced as much as one-third in volume. In moderately large goiters most of the colloid may be absorbed in from one to two weeks, and some of the very largest disappear in from three to twelve weeks. It is frequently impossible to reduce them to normal size.

At the beginning of treatment the patient's metabolic rate must be accurately determined. If the rate is below normal, it must be brought to normal or slightly above and maintained there by the daily administration, orally, of desiccated thyroid; if it is not continued after the initial dosage the vascular phenomena may reappear, and the thyroid gland will once more increase in size. The length of time desiccated thyroid should be continued depends somewhat on the results of the treatment. If the gland is materially reduced in size, desiccated thyroid is given for a few weeks longer, and then a small dose of iodine is given. If after a few

months there should again be a tendency to enlargement, the treatment may be repeated.

Largely on account of the expense incurred in repeated basal metabolic rate estimations, the routine treatment of small colloid goiters with desiccated thyroid is not recommended. Iodine may be used in these cases, and it may also be tried in cases of large colloid goiters in which the determination of basal metabolic rates is impracticable or impossible.

There are many practical problems in the treatment of patients having diffuse colloid goiter. Desiccated thyroid orally has been administered almost exclusively in the Mayo Clinic. After the patient's true basal metabolic rate has been accurately determined, relatively large doses are given daily for three or four days. This usually amounts to from 6 to 10 grains if the metabolic rate is somewhat below normal; if normal, somewhat smaller doses are given. At the end of a few days basal metabolic tests are again made and the dosage regulated from time to time so that the patient's rate is maintained at or slightly above normal. Patients vary considerably in the amounts of desiccated thyroid needed to bring about a normal metabolic rate; as a result, frequent observations and tests are necessary. It should be emphasized that the results sometimes obtained in the treatment of diffuse colloid goiter, with either iodine or desiccated thyroid, are disappointing. On the other hand, the results are very gratifying in most cases. From an economic point of view the time required and expense incurred in the treatment are considerable. However, the early treatment of colloid goiter may sometimes prevent the formation of adenomatous tissue, and in this way save the patient from a thyroidectomy later, and even though the gland is not materially reduced in size, treatment tends to prevent further enlargement.

Operation in cases of diffuse colloid goiter is rarely, if ever, indicated. There is no hyperthyroidism and the goiters often disappear spontaneously in the third decade or earlier if treated with iodine or desiccated thyroid. In certain cases, especially if the goiters contain large adenomas, operation must be resorted to, but it should be delayed until after the patient's twenty-fifth or thirtieth year.

CONCLUSIONS

1. Endemic goiter, of which colloid goiter is one form, is caused by a lack of available iodine in the thyroid gland.

2. Endemic goiter can be prevented largely by the oral administration of iodine.

3. Prevention or early treatment is exceedingly important.

4. Satisfactory results may be secured from the treatment of diffuse colloid goiter.

5. Iodine may be used in the treatment, but desiccated thyroid is more satisfactory.

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DISCUSSION

DR. O. J. HAGEN: The story of the thyroid forms a thrilling chapter in the history of medicine. The essayist has given, in the brief time allotted him, a clear and illuminating résumé on the management of the colloid goiter. I have read his paper and listened to its reading here with much profit and satisfaction. In the few minutes given me to discuss it, I can only touch upon a few points and give expression to a few thoughts the paper has evoked in my mind.

I said thrilling chapter. In all the study of science and discovery, one is fascinated by the personal element that enters into the picture. Who can read of the wonderful story of the discovery of radium and forget the heroic patience of the Curies—or that of immunology and not thrill over the marvelous insight of Pasteur—or the discovery of America and not admire the man who watched the weeks through and cheer him when the supreme moment came in sighting land.

As I look back and read the evolution of the knowledge of the thyroid gland, I am reminded of the day when the treatment of those afflicted with goiter was not so effective as it is today.

Long ago the "King's touch" was a treatment, certain kinds of stones were carried near the throat, sea weeds were piled on the tumor; the hands of the dead were laid upon it; lizards enclosed in bags were hung around the neck.

Not long ago science took a handful of sand and con-

structed a lens and now the microscope pierces the veil and brings the unseen into the plane of the seen—science became hundred-eyed in the forms of chemistry, physics, biochemistry, pathology, histology. Then Kocher, Reviden, Charles Mayo, Crile, Trousseau lent their learning and observational powers to the subject and data began to accumulate on the function of the thyroid. Then came Louis Wilson, Marine, Kimball, Crotti, MacKinley and Boothby with their pathological summaries and laboratory investigations. Then Southern Minnesota entered into the scene, and Kendall, at whose command were placed the resources of all the equipment for study that money could buy and tons of thyroid tissue from the stockyards of Chicago—at whose disposal was placed that which money cannot buy—an enthusiastic, intelligent and sympathetic co-operation—this Kendall, this slave and apostle of science, driven by high purposes and deep resolves, gave his erudition and genius to the task—and emerges out of his laboratory after months and months of painstaking experimentation, with the mystery of the thyroxin molecule in his hand.

Then we see the scientist-philosopher, Henry Plummer—biggest of them all—going up the mountain, bringing down a pentologue of principles and hurling them at the profession, saying: "1. Thyroxin is active directly or indirectly in the cells throughout the tissues of the body. 2. Thyroxin is an agent hastening the rate of formation of a quantum of potential energy available for transformation on excitation of the cell. 3. Hyperthyroidism is the physiological status of an individual otherwise normal when the thyroxin in the tissues is sufficient to hold the basal metabolism above normal. 4. Hypothyroidism is the opposite of hyperthyroidism. 5. All the phenomena of pure hyperthyroidism are those that must attend a sustained elevation of the basal metabolism."

So much for the personal side of the discussion. Now the important points to be re-emphasized are:

1. That it is largely a preventable disease and it is a blot on our escutcheon that we have colloid goiter at all.

2. We must know how to diagnose, not only the frank case, but the so-called complicated cases. Remember that by x-ray or by operation you can make a fairly compensating colloid goiter a myxedematous goiter. Sometimes the desiccated thyroid extract may not be absorbed in the intestinal tract. Then, try thyroxin.

3. We must not call the puberty hyperplasia or the colloid with bruit an exophthalmic goiter. Nor must we submit the girl who comes with a colloid, complicated with neurocirculatory asthenia, to an operation. There is a warning sent out by Dr. Foss in the last Journal of Surgery, Gynecology and Obstetrics condemning the profession because of the number of operations performed on colloid goiters, which should be treated medically.

4. Remember, a neurocirculatory asthenia is a syndrome with a normal basal rate. Do not make a decision on a single rate or on a single examination. We must not make a decision of such moment to the patient, based on short-cut determination machines manned or womaned by short-cut trained technicians.

After you are sure you have a colloid goiter, in a patient under 20, the treatment is iodine and thyroxin or thyroid tablets, sufficient to keep the metabolic rate normal or slightly above.

ABRUPTIO PLACENTÆ*

A BRIEF REVIEW WITH REPORT OF CASE

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Abruptio placentæ means a forcible premature separation of the placenta from its normal site, the fundus uteri, and usually takes place near term. It is associated with premature and still birth, and occurs as a menace to the mother about one-half as often as placenta previa—about once in 500 cases, according to Adair.

Etiology.—Considered from an etiological standpoint, DeLee believes that there are three general groups of causes:

1. Pregnancy toxemia and nephritis.
2. Diseases of endometrium and ovum.
3. Traumatism.

The last group, though small, is usually associated with one of the others. The first and second groups may be closely related.

Previous toxemia is a predisposing, if not a causative, factor.

The majority of opinions favor the belief that the ovum is the source of the toxins.

Willson, DeLee and others believe that abruptio placentæ is caused by the inundation of the uterine wall with a toxin of the nature of a hemorrhagin, liberated from the placenta, and naturally producing its maximum effect at the site of its absorption and greatest concentration.

Pathology.—The uterine muscle is degenerated and infiltrated with blood. There are many petechiæ under the peritoneum, some of which are ruptured. The muscle cells are torn apart in places by infiltrations of blood; endarteritic and degenerative changes with thrombosis are present in the blood vessels. These findings are more marked in the area of placental attachment, and account for postpartum uterine atony. The placenta also shows evidence of endarteritis, and may show the evidences of several hemorrhages, of red infarcts of varying dates, or it may be torn or compressed by the clots, according to DeLee.

Holmes says: "The symptom complex of eclampsia is markedly different from that of a toxemic apoplexy. So far as we now know, the pathological findings in the liver alone show very many characteristic differences. The coincident attack of eclampsia and toxemic abruptio placentæ strongly suggests that two intense poisons are liberated, producing diverse symptoms."

The mechanism of separation is described by DeLee as follows: The bleeding usually occurs in the center of the placental implantation, where the separation first occurs. The blood escaping under the decidua basalis may pursue four directions.

First, and most rarely, it may bulge out the uterine wall toward the abdominal cavity, and bulge into the cavity of the ovum, the edges of the placenta remaining attached to the uterus.

Second, it may dissect up the membranes all the way round, severing almost all the connections of the ovum.

Third, it may break into the liquor amnii.

And, finally, it may seek a direct passage outward from the edge of the placenta, under the membranes, through the cervix and into the vagina. The first three varieties are called "concealed hemorrhage," but in all cases the exit of the blood may be blocked by the head, or the membranes, or a firm clot plugging the cervix. The uterus may be immensely distended by the blood. A fatal intra-uterine hemorrhage may occur without a drop of blood showing externally.

The bleeding is usually first internal or concealed, and then combined external and internal, the former being merely the precursor of the latter. The mildest case and most common is the purely external hemorrhage.

Symptoms.—Acute abdominal pain usually referred to one side of the uterus, often accompanied by fetal movements and often followed by increasing backache, sudden increase in the size of the uterus, with tension of the abdominal wall, absence of fetal heart tones, a uterus of board-like consistency or soft and atonic, with the general symptoms of increasing anemia and shock, and soon external hemorrhage, constitute the foundation for a direct diagnosis.

Any of these symptoms in a woman of advanced pregnancy should arouse the strongest suspicion of a possible premature detachment.

*Read before the Southern Minnesota Medical Association, Owatonna, Minn., May 18, 1925.

Differential Diagnosis.—DeLee says: "In differential diagnosis, placenta previa, rupture of uterus and extrauterine pregnancy most frequently come up, but on rare occasions one may have to eliminate other non-obstetric accidents, as gallstone colic, rupture of an appendix or gallbladder and intra-abdominal injuries."

Prognosis.—As to prognosis, DeLee says: "The accident is one of the gravest with which the obstetrician has to deal, and it is safe to say that one-half of the women and 95 per cent of the babies in complete detachment with concealed hemorrhage will die, while a large proportion will be saved with partial detachment and under skillful treatment."

Treatment.—The method of treatment depends upon whether the cervix is or is not dilated, and whether the case is mild or serious.

Expectant treatment, including rupture of the membranes, maintenance of external pressure, observation of fetal heart tones, etc., may be resorted to in very mild cases. If the condition continues to progress, the case becomes serious.

Serious cases require prompt diagnosis and treatment. The best treatment is that which empties the uterus quickly, and with the least danger to the mother and fetus, if the fetus is alive.

Early, rapid and complete emptying of the uterus, through the parturient canal, should be attempted at once if conditions favor the method, but, if not, a cesarean section should be performed, with or without removal of the uterus. The dangers are not past after delivery. Postpartum hemorrhage is frequent, both from uterine atony and because of the hemophilic nature of the disease. DeLee says: "If the hemorrhage does not immediately cease upon the removal of the placenta, if the uterus remains flabby and does not at once contract under the influence of ergot and pituitrin, the latter injected into its substance, and if there has been previously much manipulation, supravaginal amputation of the uterus should be done."

CASE REPORT

Mrs. C. K., aged 39, multipara, at full term, had had one three months abortion, followed by six normal labors. She had never been under a doctor's care, except during labor. She had complained of backache since one month pregnant. She had had a severe attack of pain in the right lower abdomen when one month pregnant, with recovery in a few days. She had had a severe pain in the left abdomen eleven days previously and called her husband home from work, but when he came she felt better, and helped

with the family wash. She had had a sharp pain in the left lower abdomen at 5 a. m., and I saw her at 11:30 a. m., April 3, 1925. She believed she had felt life at 5 a. m., but not since. She complained of severe backache, nausea, faintness and weakness, which had become much worse since 8 a. m.

She appeared very anemic. The pulse was about 85 and weak. Blood pressure was 85 systolic, 50 diastolic. The uterus was distended, very hard and almost spherical. The fetus could not be felt and fetal heart tones could not be heard. The cervix admitted two fingers, and was firm, and the presenting head could be felt. The membranes were intact. There was no external hemorrhage. About one hour later, there was some blood-stained discharge. The uterus gradually increased in size during the next hour, and at 12:30 the bag of water spontaneously ruptured and a quart or more of blood and liquor amnii came away. She continued to flow freely until the uterus was emptied in the hospital, about twenty minutes later, under light gas anesthesia. Manual dilation of the cervix was followed by version and extraction of a dead fetus. The placenta slid out immediately after delivery of the fetus. The uterus contracted fairly well, and there was no further hemorrhage. It was noted that the blood did not clot. One pint of normal saline was given intravenously, and measures used to combat the shock. The patient's condition became progressively worse, and she died within two hours of delivery.

DISCUSSION

There are several features of the case which should receive further mention. First, this was a very severe case of abruptio placenta, with concealed hemorrhage, the hemorrhage only appearing externally, after the patient was in shock from internal hemorrhage. The baby's head and intact bag of waters acted as a cervical plug, preventing external hemorrhage. Second, the etiologic factor was probably the toxemia, causing changes in the endometrium and placenta. There was no history of associated trauma. There were no pre-eclamptic symptoms. The absence of blood clotting suggested toxemia. Third, the uterus in the case was board-like, in contrast to the atonic type of uterus, which may have been due to the fact that it was under tension from the concealed hemorrhage.

My impression is that the mortality of abruptio placenta is much too high, and can be materially lowered as follows:

First, by prevention of the causative factors by closer observation and study of all pregnant women, and all cases of abruptio placenta, including pathological study of the tissues involved, where possible.

Second, by more prompt and radical treatment, including cesarean section and supravaginal hys-

terectomy, especially in cases which appear to be progressing. With cesarean section, any degenerative changes in the uterus can be observed, and its failure to contract, after ergot and pituitrin, can be seen, eliminating doubt as to whether a hysterectomy should or should not be done. Hysterectomy eliminates postpartum hemorrhage, due to atony of the uterus, which is a too frequent cause of death.

Third, by prompt use of blood transfusion and methods to relieve anemia and shock after delivery, as many of the deaths occur in the first few hours after delivery.

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RECENT ADVANCES IN THE TREATMENT OF SYPHILIS*

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The constant introduction of new remedial agents in the treatment of syphilis is good evidence that arsphenamin alone does not meet all requirements. In fact, experience with some of the recent methods proves beyond a doubt that satisfactory therapeutic results can still be obtained when the spirocheticidal effect of arsphenamin fails. The essence of this observation is that we must still trust to a large extent to the immunity mechanism of the tissues and blood. On the other hand, it must be admitted that arsphenamin is still supreme as a spirocheticide and cannot at present be ignored in any scheme of treatment, no matter what form the syphilis may assume.

It is, of course, impossible to discuss all the remedies that have been suggested from time to time, even during the last few years. Some of them have more fancied than real value, others may in time prove to be real additions to our armamentarium. I shall confine myself to the consideration of such measures as have had a reasonably wide application and seem to fill a want not supplied by the more standard drugs.

Before discussing in detail the treatment of a syphilitic infection, I should like to call attention briefly to the advanced methods of our state boards of health in preventing the spread of the disease, and thus saving the nation an incalculable amount of money, physical pain, and mental anguish. We are all too prone, as physicians, in our desire to obtain brilliant results from treatment, to overlook the value of preventive measures. A thorough understanding of the disease has done much, however, to help in preventing its indiscriminate spreading, and we are not doing our duty when we do not take advantage of our opportunities. It is not difficult to visualize the untold misery that one infected ignorant female may cause, not only through immediate contact, but also to virtuous women and as yet unborn babes. The proper control of one such individual is worth all the expenditure of energy, time, and money that we may put into it.

*Read before the Southern Minnesota Medical Association, Owatonna, May 18, 1925.

In discussing the purely remedial procedures of more recent date, I shall confine myself to the consideration of (1) bismuth; (2) sulpharsphenamin; (3) tryparsamid, and (4) malaria.

Bismuth.—The bismuth preparations were first enthusiastically used in France. They seem never to have acquired an equal popularity in the remainder of Europe or America. On account of its toxicity, bismuth has never been used extensively for syphilis until recently, although it has been used considerably in the treatment of certain affections of the skin, ulcer of the stomach, sinuses, and in roentgenographic studies of the gastro-intestinal tract. It cannot be said even that its use in the treatment of syphilis is at all new. Timid attempts have been made with it just as with gold and silver and other heavy metals. A definite advance was made when, by chemical combinations with other basic elements, it was rendered decidedly less toxic. The large number of combinations, each usually parading under some trade-name, is astounding. Each preparation is stated to have special virtues and almost every country seems to take pride in producing combinations of its own. It stands to reason that all the various combinations are not of equal value. In the United States about a half dozen bismuth preparations are in common use. About two months ago the Journal of the American Medical Association published a study of these preparations by the Council of Pharmacy. This analysis proves that it is not a matter of indifference which preparation the practitioner chooses.

In my own work, I have used sodium potassium bismuth tartrate practically exclusively. Judging by the reports in the literature on other bismuth preparations, I feel that it has been as efficacious as we have any right to demand. I give this preparation, 0.2 gm. to the dose, intramuscularly, at intervals of from three to seven days, the average being five days. If well tolerated, twenty doses are given consecutively in each course.

It is a fact that bismuth is an energetic spirocheticide. This has been proved over and over again by observation of its effect on the early lesions, such as the chancre, the mucous patch, and the condyloma latum when teeming with treponemas. Bismuth alone will remove demonstrable organisms from these lesions in twenty-four hours. This in itself, while it is decidedly slower than the action of arsphenamin, should entitle the drug to a

welcome, since it allows a third choice when the patient is hypersensitive to mercury and the arsphenamins. It is as yet too early to say whether bismuth produces any lasting effect, nor has it been determined which bismuth combination has the highest therapeutic effect with the lowest relative toxicity. It would seem that the immediate effect of bismuth is superior to that of mercury. In some chancres, the induration does not disappear by the use of bismuth alone, nor does it seem that its effect on the enlarged glands is particularly striking. On the other hand it probably affects the condyloma latum more promptly than any other drug. The effect on the secondary eruption is slower than that of arsphenamin, and it does not produce a Herxheimer reaction. The blood Wassermann reaction is not reversed as promptly as by arsphenamin, but its reversal is probably more lasting. Certain writers laud the effect of bismuth on neurosyphilis. The fact that bismuth has been repeatedly demonstrated in the spinal fluid lends support to this opinion. I have seen the *Spirocheta pallida* disappear from mucous patches after the use of bismuth, when arsphenamin had failed. All told, therefore, bismuth may be considered a remedy of no mean value. It is usually ranked as superior to mercury and inferior to arsphenamin. In view of the undoubted value of arsphenamin, we are not at present justified in employing bismuth alone in the treatment of early infections. There is, however, little objection to their combined use. Whether bismuth will prove as desirable an adjuvant to arsphenamin as mercury, must remain undecided at present.

It is the universal experience that bismuth produces very few undesirable complications. The bismuth line practically always appears in the mouth after the fourth or fifth injection. This is not an indication to stop treatment. If reasonable cleanliness and care of the mouth are maintained, it causes no special trouble. Occasionally one also sees some discoloration of the sublingual veins, a curious phenomenon but of no practical significance.

Gingivitis is occasionally seen but it subsides rapidly when bismuth is stopped. It can probably always be avoided if the mouth is kept scrupulously clean. Ulcerative stomatitis is very rarely seen and can probably also be attributed to lack of proper oral hygiene. Albuminuria occurs fairly often, but is usually not troublesome. The kidney

should receive the same consideration as when mercury is employed. Dermatitis has been described but must be exceedingly rare; I have seen no definite case of it, neither have I seen definite evidence of a cumulative effect of the drug.

Sulpharsphenamin.—Sulpharsphenamin, a sulphurous acid ester of arsphenamin, differs only slightly from neoarsphenamin. It has been used under different names, and first attained popularity in this country after Voegtlin had published his studies. He believes that this drug is less toxic, and has greater sterilizing power than neoarsphenamin and that it is as effective therapeutically. One of its chief practical advantages is that it can be given subcutaneously and intramuscularly as well as intravenously. It is as rapidly eliminated when given intramuscularly as when given intravenously. Many experienced observers believe that the intramuscular method is the most valuable. Sulpharsphenamin causes little or no local pain in most instances, and practically no other undesirable local effects. It is probably never necessary to give a larger dose than 0.4 gm. every five days. It should be put up in a 30 to 40 per cent solution. Voegtlin believes that for penetrating the nervous system it is superior to arsphenamin and comparable to tryparsamid. I have found that spirochetes disappear from a primary lesion in from seven to ten hours after its administration. The chancre heals in from seven to ten days. In early infections I have been in the habit of giving the drug in doses of 0.4 gm. every three days for the first three doses and then every five days until a total of 8 gm. have been given. After the third dose the patient begins mercury inunctions. These are continued until the second course of sulpharsphenamin is begun in about six weeks. I plan to give a total of four courses of sulpharsphenamin. Under this regimen there have been no neurorecurrences, and the therapeutic results have seemingly been excellent. I would not encourage the subcutaneous method as the drug can be as readily given intramuscularly. There is no objection to giving it intravenously, but there is no special advantage in this unless it has proved too painful intramuscularly and the patient is sensitive to the other arsphenamins. Whether in its ultimate sterilizing power it is equivalent to arsphenamin, only future experience can determine. It can, however, be confidently employed as an effective drug,

in the treatment of syphilis, particularly cardiovascular syphilis, when given intramuscularly.

Dermatitis following the administration of sulpharsphenamin is a possibility, but in my experience this has caused little trouble. Probably the most serious complication is hemorrhagic purpura or even aplastic anemia. These unfortunate complications can be produced without intensive treatment. They should always be watched for, but if the drug is given in only moderate dosage they need be feared but little.

Tryparsamid.—Tryparsamid has been widely discussed in this country during the last two years. Its place in the treatment of syphilis is as yet undetermined. It is likely that the first reports were entirely too enthusiastic. There is no doubt that patients with mental symptoms suggestive of early paresis and with positive serologic findings in the blood and spinal fluid are often materially improved symptomatically. Occasionally even the findings in the spinal fluid become entirely negative. There seems to be a rather marked tendency to relapse, however, both in the clinical symptoms and the serologic findings. Tryparsamid may have some value in the treatment of cardiovascular syphilis, but it probably is no more valuable than arsphenamin. It has no value in the early stages of syphilis and is inferior to arsphenamin in latent syphilis and tertiary lesions. I am inclined to believe that it manifests its best effects in cases of neurosyphilis, when systematic treatment by the arsphenamins has been given previously. The greatest drawback to this drug is its effect on the eyes. It produces retrobulbar neuritis and thus amblyopia. It should never be given in the presence of any impairment of the optic nerve. Collaboration with a competent ophthalmologist is very desirable, and on the slightest warning, as when the patient complains of seeing flashes of light, or clouds appearing from nowhere, or of feeling that the floor is coming up toward him, the drug must be stopped at once. It is commonly administered in doses of from 1 to 3 gm. dissolved in water, once a week, until ten doses are given. Such a course is repeated after a two months' rest.

Malaria.—The treatment of syphilis by artificial malarial infection has been the outgrowth of observations and studies showing the value of utilizing the body's defense mechanism. It had long been noticed that intercurrent febrile infections had a definitely beneficial effect in general paresis. On

the assumption that the results observed were due to the febrile attacks, efforts were made to produce them by the injection of such substances as sodium nucleinate, staphylococcus and streptococcus vaccine, typhoid vaccine, and tuberculin. In 1917, Wagner von Jauregg conceived the idea of producing febrile attacks by inoculating patients with malarial organisms. This has proved so far, undoubtedly, the most valuable application of the principle.

The method is very simple, but not without its definite dangers. At the present time its use should be confined entirely to institutions.

While different methods of administration have been tried, I find it most practical to inoculate the patient with 5 c.c. of malaria-infested blood intravenously. The blood is obtained from a patient in the active stage of infection. Since no method of keeping the plasmodia in vitro for a long period has been devised as yet, it is always necessary to have an infected patient on hand. Obviously, such treatment is only practical when a considerable number of such patients are observed regularly. It is, however, possible to transport the plasmodia with proper precautions, and infections have been obtained from injections of blood twenty-four hours' old.

There is no evidence that the virulence of the organism is increased by repeated passage through human hosts. The course of the infection, however, differs markedly in different individuals, probably owing to individual resistance. It is absolutely necessary that a pure tertian strain be employed because the others are entirely too dangerous. Some of the patients, when infected, present a classical tertian course; others follow this course for a few days and then suddenly change to the quotidian type; others show the quotidian febrile curve from the start. All types of variations from this course may be observed. I usually allow the patients to have twelve paroxysms before checking the infection with quinin. It has been found that eight attacks are sufficient to produce definite therapeutic effects, and sometimes it becomes necessary to stop the attacks before the desirable dozen have been reached. The temperature often reaches 106° F., but it is a fact that the height of the temperature does not influence the therapeutic effect. Usually a certain degree of anemia is noted during the febrile course. Occasionally there is edema of the ankles, icterus, and enlargement of

the spleen. It is very important that the heart be closely watched, since it probably bears the brunt of the attack.

When the required number of paroxysms have passed, there is no difficulty in stopping the fever by the administration of quinin. Usually there are no more paroxysms after the first dose of quinin, but occasionally another mild attack occurs. The quinin is then given at definite intervals for about a month. I have never seen a relapse of the paroxysms when quinin was given properly. It is always desirable to have such a preparation as quinin urethan on hand. This can be given intramuscularly and the attacks promptly averted at any moment.

The clinical response to this method of treatment has been very striking. Like all observers who have had a reasonable experience with this method of treatment, I have been able to bring about quite satisfactory remission of the syphilitic symptoms in more than 50 per cent of cases. This is really a striking contrast to the little that could be done for general paresis even a few years ago. It must be remembered that this treatment is not for patients that have been kept in institutions for a long time. Elderly and decrepit patients are excluded by the risk. It probably has no effect on juvenile paresis. Experience with this form of treatment is now extensive enough, I believe, to justify the assertion that it is one of the outstanding achievements of modern therapy.

The method has also been used in a limited number of cases of neurosyphilis without evidence of paresis. While the number of patients treated has probably been too small from which to draw conclusions, sufficient evidence has accumulated to indicate that the progress of infection can be arrested. The findings in the spinal fluid in cases of early neurosyphilis have been reversed to normal, and the fluids, persistently positive in the later stages, refractory to standard measures including even intraspinal injections, have returned to normal. Tabetic lightning pains have been much improved, and optic atrophy checked.

One of the striking features of this treatment of paresis is that the serologic improvement does not keep pace with the clinical. There is usually very little change in the spinal fluid even after there has been complete remission of symptoms. The general tendency of the fluid is, however, to return gradually to normal, sometimes after many

months or even years. The clinical improvement may be quite apparent even during the febrile period, but sometimes not for many months later. Since many patients have shown continued psychic improvement for more than a year it is well not to give up hope. The remissions are, of course, not all equally complete. Some patients become practically their normal selves, in others some stigmas are apparent to the psychiatrist but not to their lay companions; others again may take up simple occupations but retain a definite residual dementia. It is likely that the degree of improvement is determined by the amount of parenchymatous injury sustained by the brain.

The mechanism of these striking clinical results is as yet obscure. An effect purely dependent on fever can probably not be assumed. Beneficial results have been noted in patients whose temperatures have never risen to the point necessary to kill the spirochetes. The effect of leukocytosis can be ignored because leukocytosis does not appear with malaria. When leukocytosis is manifested it

is the result of some complication. It has been noted, for instance, that pyogenic meningitis with marked leukocytosis did not interfere with the viability of the spirochetes in a case of paresis. To explain it as merely the effect of foreign proteins produced by the malaria, would seem especially lame, since the effects obtained from streptococcal and typhoidal vaccines were decidedly inferior. It has been suggested that the plasmodium produces antibodies that simultaneously act as immune bodies against the *spirocheta pallida*, an overlapping of the immunity as it were. At the present time it must be said that we have no satisfactory explanation of the mechanism of this therapeutic action of malaria.

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COFFEE DRINKING BY CHILDREN

Coffee drinking by children has long been regarded with disapproval by pediatricians. There are a number of objections to the practice, among which its harm to the nervous system is important. It is entirely conceivable that the use of caffein-containing beverages by the child will lead to the production of serious nervous defects later in life.

In their recent book, "Safeguarding Children's Nerves" (1924), Drs. Walsh and Foote clearly indicate that there is an increasing nervous instability of American people as demonstrated by the failure of many of our troops to withstand the stress and strain of active service. These writers believe that the numerous cases of shellshock which were suffered by many American soldiers in the World War were nothing more than cases of hysteria. It is possible that the early use of coffee has had a contributing part in causing the lack of nervous balance that is exhibited by so many adults in this country.

The drinking of coffee in the United States is steadily increasing, and the average annual consumption now amounts to thirteen pounds or more per capita. No small portion of this coffee is used by children, as shown by a study of the diet of a large number of children of preschool age at Gary, Indiana. This survey was made by the Children's Bureau of the United States Department of Labor. The report mentions that "two-thirds of the entire group were found to drink coffee habitually, and 40 per cent to have it more than once a day. Not only so, but in certain of the groups of foreign-born parentage, coffee was drunk by more than 90 per cent of the children, and three-fourths of the Polish group had it two or more times a day."

In 1912, C. K. Taylor, a psychologist, made a study of coffee drinking by school children. He found that out of

a group of 464 children, over 70 per cent of them were coffee drinkers. Moreover, and more important still, he discovered that those children who drank the most coffee received the lowest grades. There is no doubt but that coffee drinking by children is generally deleterious to the nervous system of the child. But the greatest harm done to children by this drink is its replacing milk in the diet. The Gary report, referred to above, states that coffee drinking by children "appears to have been inversely proportional to the use of milk. Not only do the schedules show about the same percentage of children drinking coffee as those lacking milk, but a comparison of coffee drinking by milk groups shows the use of coffee to increase markedly as the amount of milk decreases." Commenting upon the disastrous effect of replacing milk by coffee, the report states further: "To leave out milk and substitute coffee plays havoc with any diet, whatever may be its redeeming features."

It is a well known fact that children easily acquire a taste for coffee and are less willing to drink milk after being permitted to use coffee. Miss Lucy H. Gillett, Superintendent of the Nutrition Bureau of the New York Association for Improving the Poor, says in this connection that "children should never be given tea or coffee, not even to flavor milk. They will more often like milk if they are not first taught the combination of milk and coffee."

There are two important reasons why coffee should not be given to children. First, it has the harmful effect of crowding milk out of the dietary of the child. Second, it is an undesirable and unneeded stimulant.

In view of the fact that a large number of American children, especially in the industrial classes, are coffee drinkers, the matter is worthy of serious consideration.—*Mellon Institute of Industrial Research.*

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION, SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN MINNESOTA MEDICAL ASSOCIATION, AND MINNEAPOLIS SURGICAL SOCIETY

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its

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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

VOL. VIII

DECEMBER, 1925

No. 12

EDITORIAL

The Germ Cause of Cancer

Every announcement that a germ has been found as the cause of cancer is always received both by the profession and the laity with great interest. Apparently it is a simple explanation and everyone is now so thoroughly trained in the notion of the bacterial causation of disease that ready acceptance of any announcement of the type is not to be wondered at. The only difficulty is that there are so many candidates for election that it is difficult to make a choice.

In the past few years dozens of legitimate—and a considerable number of illegitimate—organisms have been brought forward as offering the final solution of the cancer problem. But if we look a little deeper into the question there are many difficulties to the ready acceptance of so simple an explanation. In the first place it is perfectly easy to isolate organisms of a variety of types from cancer, both human and animal. Apparently, how-

ever, these organisms are harmless saprophytes in the tissues. Possibly some of them play a part in giving rise to the chronic inflammation which underlies the appearance of many carcinomata, occupying the same rôle as some of the coarser organisms such as the *Bilharzia*, which induces cancer of the bladder, or the *Paragonimus*, which is a frequent cause of cancer of the liver in China and Japan. With the elimination of the ordinary types of visible organisms attention has been directed to the possibility of an ultramicroscopic parasite. The first real evidence in support of this belief was discovered by Rous in a tumor of the fowl, which could be transplanted from one animal to the other by the filtered juice of the tumor, the agent, whatever it was, passing a number 5 Berkefeld. Rous was never able to isolate a parasite and the matter was dropped for a number of years until Nuzum announced that a filterable organism which he had isolated was capable of causing cancer. Nuzum's results were enthusiastically supported by Ochsner, but on the whole the scientific fraternity was inclined to look rather coldly upon Nuzum's claims, especially as the number of true tumors which he produced was small and their appearance might be explained by spontaneous occurrence in the animals which he used.

The most recent germ is that of Gye and Barnard, who believe that they have demonstrated an ultramicroscopic parasite as the cause for all types of cancer. Their demonstration, however, rests upon extremely difficult and technical procedures and most bacteriologists and pathologists are unwilling to accept their hypotheses without very thorough checking. As a matter of fact, Gye has not even proved that the Rous chicken sarcoma with which he worked is caused by a parasite, though he and Barnard believe that certain forms which they have photographed do represent the causative organism. It may take many years to prove or disprove the theories which they have advanced. One real achievement, however, has been the demonstration of the possibility of the transfer by a filtrate of a mouse tumor, though the necessary procedure is much more complicated than that necessary for the chicken sarcoma of Rous.

Despite, therefore, these announcements, most of those who are working on cancer still hold that the process is not directly incited by bacteria. Their reasons are that in general cancer cannot be transferred from one animal to another if the cells

are robbed of their vitality by freezing, by crushing with sand in a mortar or after killing by x-ray. Nor is any immunity produced by the injection of large quantities of tumor tissue so devitalized. The organisms with which bacteriologists are familiar are all foreign to the animal host and therefore act as antigens and give rise to some type of immunity. No such immunity, however, is detectible after the injection of tumor material. Bacteria which infect cells also, so far as we know, act destructively upon the invaded individual cell instead of causing it to proliferate. The easy production of cancer by certain irritating chemical substances, such as tar, also seems difficult to explain on a bacterial basis. The occurrence of congenital tumors, growths containing elaborate embryonic structures, rudimentary voluntary muscle fibers and nerve tissues, are also difficult to interpret in terms of bacterial stimuli. So, too, the elaborate genetic studies made on mice by Maud Slye do not accord with a bacterial origin. The universal occurrence of cancer in all races of mammals and in all parts of the world implies the presence of an organism of a geographic distribution unknown to other types. Thus while the bacterial cause of cancer is always possible from a philosophical point of view, the organism must be so different from any which we now know that those who have been trained to look upon cancer as a life phenomenon with merely abnormal growth capacities in the tissues are not ready to accept the new idea without extraordinarily cogent proof. Such proof has by no means been brought forward in support of any of the organisms so far isolated, and it would seem wise to wait until it is forthcoming before changing long established views of the origin of cancer.

FRANCIS CARTER WOOD,

Director of the Institute of Cancer Research,
Columbia University. New York.

Anterior Poliomyelitis in Minnesota

Minnesota during the past fourteen months has suffered its most severe epidemic of anterior poliomyelitis. There have been reported to the State Board of Health nearly one thousand cases and a record of ninety deaths, showing the severity of the 1925 epidemic. The exact number of so-called abortive cases, which were numerous, according to various physicians connected with the epidemic,

will never be known. Many mild cases with only slight muscular weakness or slight remaining paralysis are seen daily by physicians, who find the patient doubtful about the time of attack. The greatest number of cases are in the southeastern counties; there are only a few cases in the northern counties.

An examination of many reports of cases, as they have come in to the State Board of Health, discloses an unusual number of the bulbar type of cases and a marked tendency to paralysis of the upper extremities and trunk. A tendency to early recovery has also been noted in many cases examined.

A very large number have received Rosenow's serum as a curative and many have been inoculated as a preventive measure.

A final tabulation of the results should lead to a more definite conclusion as to the value of the serum. Certain difficulties, however, present themselves. Rosenow feels that the serum should be administered before the onset of paralysis. An abnormal cell count in the spinal fluid in the presence of an acute febrile attack with a red throat is considered sufficient indication for serum administration, when poliomyelitis is epidemic. The great variation in the paralysis and recovery and the difficulty in early positive diagnosis before the onset of paralysis are factors which are likely to make evaluation of the serum treatment in this disease difficult.

Early, repeated spinal drainage has been of great value in relieving pain, headache and delirium in the acute stages. It is important for medical men to remember that intelligent care during the first six months of anterior poliomyelitis results in great benefit. According to well-known authorities, massage, manipulation, exercise, stimulation of muscles by electricity or even weight bearing are to be absolutely prohibited until all tenderness over nerve trunks of the extremities has disappeared. Rest in bed, mechanical supports, extra warmth through clothing and radiant heat is the method used until the so-called neuritis has disappeared. Manipulation, massage and muscle strain only tend to exaggerate and prolong tenderness and prevent recovery.

After tenderness or neuritis has disappeared—which may require weeks or months—the patient is ready for intelligent treatment: through supports

and braces to prevent deformity and muscle strain; extra warmth to affected parts; extra clothing, radiant heat, hot baths, electric lamps, etc.; gentle massage, frequent and of short duration, and muscle training or re-education of muscles through a competent physician of physiotherapist.

If such measures are used we may expect the following return of muscles as cited by the late Dr. Lovett, whose knowledge was gained by the examination of over five thousand cases of poliomyelitis following the recent epidemic in the New England States:

PERCENTAGE OF GAIN IN THREE YEARS

	Approximate Per Cent		
	Full recovery	Partial recovery	No recovery
<i>Upper Extremities—</i>			
Wrist extensors	68	12	20
Wrist flexors	63	9	28
Trapezius	61	22	17
Pectoralis major	59	21	20
Biceps	59	25	16
Triceps	59	20	21
Posterior deltoid	56	22	22
Anterior deltoid	53	29	18
<i>Trunk—</i>			
Abdomen	30	19	51
Back	78	17	5
Neck	90	8	2
<i>Lower Extremities—</i>			
Gluteus maximus	34	26	40
Peroneals	32	28	40
Hip flexors	30	33	37
Hamstrings	24	49	27
Gastrocnemius	22	40	38
Hip abductors	21	34	45
Quadriceps	21	42	37
Posterior tibials	14	28	58
Anterior tibials	12	36	52

Diphtheria Immunization

At the annual meeting of the State Sanitary Conference, a report of which appears in part elsewhere in this issue, much attention was paid to the desirability of general immunization of school children throughout the state by means of inoculations with diphtheria toxin-antitoxin.

The procedure is simple, consisting of the hypodermic injection of 1 c.c. of the mixture on three occasions at weekly intervals. The dose recommended by the New York Health Department for the last few years is only one-thirtieth the strength

of that originally used and has proven just as effective as the stronger dose, using the Schick test for control. Local and general reactions are negligible.

Since August 1, 1915, there has been free distribution of diphtheria antitoxin in Minnesota. Increase in yearly appropriations for this purpose and reduction in price has led to the accumulation of a surplus in funds which it has been suggested might well be expended for active immunization with the toxin-antitoxin mixture. The resolution was passed by the Conference requesting the State Board to provide diphtheria toxin-antitoxin for distribution to health officers, who, in co-operation with school authorities, may arrange for immunization of school children.

The free distribution of diphtheria antitoxin in Minnesota since 1915 has cut down the mortality of the disease about as much as can be expected from this method. And yet during the years 1918 to 1924 there occurred 28,852 cases of diphtheria in Minnesota with an average of 238 deaths each year. Over a third of the deaths occurred during the first five years of life and four-fifths of the deaths occurred under the age of puberty. The immunization of all children is the new goal set.

There is one phase of the immunization of children of school age which should not be overlooked. Immune school children may easily become carriers of diphtheria without developing clinical manifestations and bring the disease home to the unimmunized younger children in the household. Children under school age are even more susceptible than children in the primary school grades. Any campaign for immunizing school children against diphtheria should include propaganda and provision for immunizing children of pre-school age from the age of six months up, just as in the case of smallpox vaccinations. This point cannot be too greatly emphasized.

Asthmolysin.—According to the advertising, Asthmolysin is a German proprietary and is "a combination of the suprarenal and pituitary hormones in distinct proportion," which is prepared by a "special method." In the series of articles on glandular therapy published under the auspices of the Council on Pharmacy and Chemistry, the opinion was given that the use of pituitary in bronchial asthma is contraindicated. (Jour. A. M. A., October 27, 1925, p. 1243.)

OBITUARY

FLORENCE C. NICHOLS BAIER

Florence C. Nichols Baier was born at Columbia, Ohio, Sept. 21, 1854, the daughter of George Lewis and Elizabeth Adams Nichols.

She entered Oberlin College in 1871 and received there the degrees of B.A. and M.A. She taught in the country schools of Ohio and later in the Academy of Oberlin College during her college years, and after graduation she taught in Calumet, Mich., Rochester, Minn., and Buffalo, N. Y., where she became Dean of the New York State Normal School.

In 1885 she married Rev. Leo. Baier, President of Hannibal College, of Missouri. Following his death two years later she became a teacher of Latin in Minneapolis Central High School, and during this time pursued the study of medicine, graduating from the Hamline College of Physicians and Surgeons in 1897.

She practiced in Owatonna, Minn., 1898 to 1900, and for two years was resident physician of the State Hospital for the Insane at Jamestown, N. D. Since 1902 she had carried on a general practice in Minneapolis until about a year ago, when failing health forced her to give up her work. She died Oct. 3, 1925, at the age of 71, after a month's illness in bed at the home of her daughter in Batavia, Ill.

She is survived by a sister, Mrs. Elizabeth Bentley, of Minneapolis, and a daughter, Mrs. C. E. Ward, a well-known author, of Batavia, Ill.

Dr. Baier was a member of the Vine Congregational Church. She was a member of the Hennepin County Medical Society, the Minnesota State and American Medical Associations, as well as of a number of college, alumni, and teachers' organizations. She was permanent secretary of the Oberlin College Class of 1875. She had from her earliest youth been an ambitious student and an enthusiastic educator, carrying her studies into her adult years. After her years of actual teaching were over she gave generously of her time, talents and energy to numerous educational organizations and institutions and identified herself particularly with all movements for the political and professional advancement of women.

J. C. MICHAEL,

J. H. SIMONS,

OLGA S. HANSEN, Chairman,
Historical and Necrologic Committee,
Hennepin County Medical Society.

DR. KNUTE HOEGH

Dr. Knute Hoegh, fellow of the American College of Surgeons and chief of surgeons at St. Barnabas Hospital, Minneapolis, died at his home November 2, 1925, after an illness of two and one-half years.

Dr. Hoegh, who was 82 years old, was born at Trondhjem, Norway, where he received his early education.

He was graduated from the medical school at Oslo University, Christiania, in 1869, and the same year came to America. In 1870 he removed to La Crosse, Wis., where he practiced for 18 years. Coming to Minneapolis in 1888, Dr. Hoegh practiced surgery at St. Barnabas Hospital and later was made chief of surgeons.

Dr. Hoegh was a prominent worker among Norwegians of this country, and in 1906 was decorated with the Order of St. Olaf by King Haakon of Norway, for "distinguished service among his fellow countrymen in the United States."

Surviving are his wife and three daughters, Mrs. E. C. Hibbee, Minneapolis; Mrs. F. M. Ayres, Indianapolis, and Mrs. Charles J. Bell, Bronxville, N. Y.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

Plans for the 1926 annual meeting of the State Medical Association are well under way. The General Arrangements Committee of the Ramsey County Medical Society, under the direction of Dr. George Earl, St. Paul, has recommended the week of May 24 as the date for the meeting, which will be held in St. Paul. Monday, May 24, will be devoted to sessions of the Council and House of Delegates with a Medical Economics meeting scheduled for the evening. Both the doctors and their wives are cordially invited to attend the evening session. Scientific sessions will occupy Tuesday and Wednesday, May 25 and 26, followed by special clinics on Thursday and possibly Friday.

The program committee of the State Medical Association, composed of Dr. C. B. Wright, Minneapolis, chairman of the medical section; Dr. C. M. Smith, Duluth, secretary; Dr. Theodor Bratrud, Warren, chairman of the surgical section; Dr. Waltman Walters, Rochester, secretary, and Dr. E. A. Meyerding, association secretary, have requested that all members desiring to appear on the program send in the titles of their papers to the secretaries of the respective sections or to the association secretary, 11 West Summit Avenue, St. Paul.

Dr. W. F. Braasch, Rochester, first vice president of the association, will act as chairman of all joint meetings and of the General Arrangements Committee.

MINNESOTA STATE SANITARY CONFERENCE

St. Paul—Nov. 5 and 6, 1925

The annual meeting of the Minnesota State Sanitary Conference always furnishes interesting material for consideration, but is presented here briefly and only in part.

The statewide use of diphtheria toxin-antitoxin immunization received considerable attention this year. The procedure has been in use for about ten years and after some modification is now well established. Antitoxin for the past ten years has been distributed free of charge to physicians throughout the state. The mortality averaging about 57 per 1,000 the past seven years is about as low as can be obtained with antitoxin in the treatment and temporary immunization against diphtheria.

During the past seven years there have been 28,852 cases of diphtheria in the state with an average of 238 deaths a year from this cause. Thirty-seven per cent of these deaths occurred in children under 5 years of age (15 per cent of the cases). Thirty-one per cent of the deaths occurred in the age period of 5 to 9 years, although only 28.5 per cent of the cases fall in this age group. The susceptibility to diphtheria is greatest under school age.

A resolution was passed by the Conference requesting the State Board of Health to purchase diphtheria toxin-antitoxin for distribution to health officers who, in co-operation with school authorities, may arrange for the immunization of school children. The proposal was acceptable to the State Board and it is to be hoped that the Department of Administration and Finance will approve the expenditure.

Dr. O. McDaniel, Director of the Division of Preventable Diseases of the State Department of Health, presented the poliomyelitis figures. Cases had been reported from 81 of the 87 counties in the state since June 1. In June there were 11 cases reported; in July, 112 cases; in August, 311 cases; in September, 308 cases, and in October, 139 cases. Reports of 91 deaths had been received so far.

Following the State Conference of Social Work, Dr. Max Seham, chairman of the Health Section, presented a resolution in behalf of these paralyzed children to the Governor. Through him a special appropriation of the Calamity Board will be made available for carrying out a program outlined by Dr. Chatterton.

Dr. George McCoy, Director of the Hygienic Laboratory of the United States Public Health Service, Washington, D. C., reviewed the recent advances in medical science relating to the control and prevention of scarlet fever. He urged that physicians take advantage of the scarlet fever serum in the treatment of toxic cases and that susceptible children exposed to scarlet fever in the home be immunized. However, he stated that owing to the fact that constant improvement in methods is being made and new discoveries are likely to occur which will make these procedures of specific treatment and immunization more valuable just as was the case in the development of diphtheria antitoxin and toxin-antitoxin, it would be best to defer any general campaign for immunization against scarlet fever.

Dr. Ruth E. Boynton, Director of the Division of Child Hygiene, compared Minnesota with other states in relation to the health of mothers and infants. The infant mortality in Minnesota is much lower than that of the registration area of the United States. One reason for this is that the Division of Vital Statistics secures complete birth records. The death rates are figured on a basis of 1,000 living births reported. Minnesota's rate in 1924 was 56 deaths per 1,000 living births. The registration area shows a rate of 76, according to the census report of 1922.

Deaths due to the puerperal state in Minnesota are lower than in the registration area. The United States census figures for the registration area in 1923 shows the death rate from puerperal causes per 100,000 population at 15.6. Minnesota's rate in 1923 was 12.8. In 1924 it had fallen to 10.3. Better care of the prospective mother and better obstetric service will further reduce the deaths from puerperal causes.

Dr. O. McDaniel, Director of the Division of Preventable Diseases, reviewed the contagious disease situation of the past year. She stated that the smallpox epidemic was the most severe one in the history of the state. In the 20 months ending September, 1925, there occurred in Minnesota 4,041 cases of smallpox and 503 deaths. In the previous 25 years during which only one outbreak of the malignant type occurred, there were 79,638 cases and only 394 deaths. The malignant outbreak was in 1917, when 92 cases with 17 deaths occurred following the introduction of malignant smallpox from Canada.

Of the 503 fatal cases in the recent epidemic only one occurred in a person successfully vaccinated within 7 years previous to the attack. This was a 14-year-old boy who was vaccinated in March, 1921, and died of smallpox in January, 1925. He also had Hodgkin's disease and in January, 1924, had been given about one year to live by the Mayo Clinic.

88 deaths occurred in persons successfully vaccinated more than 7 years previous to the attack.

390 had never been successfully vaccinated, and 24 could give no history of vaccination and showed no scar.

Over 82 per cent of all the fatal cases had never been successfully vaccinated.

The last death from smallpox occurred August 1 in St. Paul. The state is practically free of smallpox at the present time. General vaccination has been carried out throughout the state.

Dr. Benjamin F. Simon, Health Officer of St. Paul, was unanimously elected president. Dr. B. F. Van Valkenburg of Long Prairie, Health Officer of Todd County, was elected vice president, and Dr. A. J. Chesley, secretary of the State Board of Health, was continued as secretary-treasurer for 1926.

ST. LOUIS COUNTY MEDICAL SOCIETY

The St. Louis County Medical Society held its annual session the evening of October 8 at the Hotel Duluth. There were present about seventy members.

The record of the year was reviewed by the president, Dr. F. H. Magney, and Dr. L. A. Barney was elected as his successor, with Dr. F. J. Lepak taking the place of secretary left vacant by Dr. Hilding Anderson.

The address of the evening was given by Dr. Herman Johnson, of Dawson, Minnesota, president-elect of the State Medical Association. The speaker reviewed the triumphant events of the past legislative session, stressing the results of effort and united action. Dr. C. B. Wright, of Minneapolis, who accompanied Dr. Johnson, spoke, also, briefly outlining the need of collective interest and effort in preparing for the next and succeeding legislative programs.

PARK REGION MEDICAL SOCIETY

At the recent annual meeting of the Park Region District and County Medical Society held in Fergus Falls, the following officers were elected for the coming year: President, Dr. P. G. Cowing, Evansville; vice president, Dr. A. J. Lewis, Henning; secretary-treasurer, Dr. Theo. Satersmoen, Pelican Rapids.

MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

The Minnesota Academy of Ophthalmology and Otolaryngology at the annual meeting elected officers as follows: D. L. Tilderquist, M.D., President; E. R. Bray, M.D., 1st Vice President; J. M. Robinson, M.D., Duluth, 2nd Vice President; W. E. Camp, Chairman Council; John H. Morse, M.D., Secretary-Treasurer.

Dr. Thomas Shastid of Superior was elected to honorary membership in the Academy.

The Academy met at the Minneapolis Club, Friday evening, November 13, at 6 o'clock, for dinner, and held its meeting in the Hennepin County Library at 8 o'clock, with Dr. D. L. Tilderquist of Duluth, the incoming President, in the chair. Dr. Virgil J. Schwartz presented a paper, "Three Friends Who Made Ophthalmological History—Donders, Bowman and Von Graefe." Clinical cases were reported.

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

The Southwestern Minnesota Medical Society met Oct. 29, 1925, at Lakefield, Minn. The program was as follows: President's Address—Dr. J. M. Hilger, Iona, Minn.

"Infant Feeding"—Dr. Ellsworth Johnson, Windom, Minn.
"Rural Obstetrics"—Dr. Wm. A. Piper, Mountain Lake, Minn.

"Melena Neonatorum"—Dr. Thos. Lowe, Windom, Minn.
"Caesarean Section"—Dr. L. L. Sogge, Windom, Minn.

Report of the Tri-State Medical Meeting—Dr. A. G. Chadbourne, Heron Lake, Minn.

The next meeting will be held in the New Ashton Memorial Hospital, Pipestone, Minn., in May, 1926.

The officers elected were: Dr. H. C. Doms, Slayton, Minn., President; Dr. A. G. Chadbourne, Heron Lake, Minn., Vice President; Dr. E. G. McKeown, Pipestone, Minn., Secretary-Treasurer.

The censors elected were: Wm. A. Piper, Cottonwood County; W. J. Taylor, Pipestone County, and C. O. Wright, Rock County. All were elected to serve for three years.

OF GENERAL INTEREST

Dr. H. L. Goss, formerly of Minneapolis, is now engaged in practice in Seattle, Washington.

Dr. H. F. Binger has announced the new location of his offices at 710 Lowry Bldg., St. Paul.

Dr. Robert Guilmette has taken over the practice of Dr. O. A. Kibbe at Canton, Minnesota. Dr. Kibbe is now located in Minneapolis.

Dr. Paul A. Schmidt of Mapleton has returned to his former location at Good Thunder, where he succeeds Dr. George Schlesselmann in his practice.

Dr. N. W. Haddow of Chippewa Falls, Wisconsin, and Dr. E. H. Smith of Minneapolis have become associated with Dr. Iver S. Benson of Montevideo and have organized the Montevideo Clinic.

Dr. M. G. Peterman, associate in pediatrics at the Mayo Clinic, Rochester, has accepted the position of Director of Laboratories and Research at the Children's Hospital, Milwaukee. Dr. Peterman will also have a private consultation practice in Milwaukee.

Three medical fraternities head the list of all professional fraternities at the University of Minnesota in scholastic standing, as shown in a recent statistical report given out by E. E. Nicholson, dean of student affairs. The order of their rank is as follows: Phi Delta Epsilon, Sigma Delta Epsilon and Phi Chi.

Dr. A. J. Chesley attended the fifth annual conference of Health Officers and Public Health Nurses conducted by the Michigan Department of Health and the Michigan Public Health Association, at Lansing, Mich., in November. He also took part in the sixth annual conference of Health Commissions and the State Department of Health of Ohio.

At a meeting of the graduates of the Ensworth Medical College, held in October at Kansas City, Missouri, a medical college alumni association was organized with a view of promoting acquaintance and good fellowship among the graduates of the institution. All professors and graduates of the Ellsworth, Central and Northwestern Colleges of St. Joseph are requested to send their names to the Secretary, Dr. Charles Wood Fassett, 115 East 31st Street, Kansas City, Missouri, for full information and application blank.

"Four Cases of Splenomegaly With Anemia" was the subject of the evening for the meeting of the Minnesota Pathological Society, held November 17 at the University of Minnesota Medical School, in the Institute of Anatomy. The following appeared on the program: Dr. William A. O'Brien, "Primary Tuberculosis of the Spleen"; Dr. Kano Ikeda, "Brill's Giant Follicular Splenomegaly"; Dr. Hal Downey and Dr. C. J. Watson, "Megakaryocytic (?) Leukemia"; Dr. H. L. Ulrich and Dr. C. J. Watson, "Banti's Disease."

News has been received from Vienna that Dr. Baron Pirquet, world famous specialist in pediatrics and a professor in the School of Medicine at the University of Minnesota for ten days, is dying at his home in Carlsbad as the result of injuries received when he jumped from a hotel balcony following an hallucination that he was surrounded by flames. Baron Pirquet, who accepted a professorship in the School of Medicine in 1923, astounded administrative authorities when he resigned from the position after ten days, stating that he was homesick and needed by people of his homeland in the hospital of Vienna.

Under the leadership of Dr. Ralph W. Webster, of Chicago, a nation-wide committee of doctors has been organized to raise a fund of \$250,000 as a contribution from Rush Medical College alumni toward the general development funds of the University of Chicago. This sum of \$250,000 to be given to Rush doctors will be part of the \$2,000,000 which alumni of the University are raising and which is to go toward the comprehensive program of construction and endowment covering the immediate needs of the institution. The medical schools of the University, of which Rush is now a part, will be able to control their

policies of education and adapt them to the best developments in medicine in the future. A great program of postgraduate medical education will be carried on in the new buildings of Rush on the West Side, the Presbyterian Hospital, the Central Free Dispensary, the John McCormick Memorial Institute for Infectious Diseases, the Children's Memorial Hospital, the Home for Destitute Crippled Children, the Cook County Hospital, and the Country Home for Convalescent Children. Postgraduate medical training and instruction is needed especially in the middle west, and the medical profession will appreciate this service.

CHRISTMAS SEALS

The eighteenth annual Christmas Seal sale to raise funds for continuing the general educational campaign against tuberculosis and for health is now on. The state campaign directed by the Minnesota Public Health Association and its affiliated county units reaches into every corner of Minnesota and hundreds of volunteer Christmas Seal salesmen from school boys and girls to prominent society and club women and busy men are bending their efforts to make the sale a success.

An unusually large number of physicians are this year taking an active part in the Christmas Seal sale, and also in the activities of the County Public Health Association throughout the state. Nearly every county organization has one or more of the local physicians among its officers or board of directors. The educational side of the Christmas Seal sale will be especially stressed this year and a Speakers' Bureau, headed by the tuberculosis sanatorium physicians, has been organized.

The following are included in the statewide educational health work carried on this year with the Christmas Seal funds:

Publication of the Northwestern Health Journal;

Tuberculosis Clinics to search out unsuspected cases early and to popularize the "periodic medical examination" habit;

Children's clinics;

Publication and distribution of free literature and posters;

Presentation of the book "Health Training in Schools" to teachers throughout the state;

Enrollment of school children in the Modern Health Crusade, a plan in which they are awarded rank for the daily practice of health habits;

Exhibits, motion picture films, lectures and radio talks;

A fresh air camp for pre-tuberculous children;

Partial support of a children's preventorium;

Nutrition demonstrations for underweight school children;

Public health nursing service;

Occupational placement bureau for ex-sanatorium patients.

"Buy and Use Christmas Seals" is the appeal of the Minnesota Public Health Association to physicians throughout Minnesota. The cheery little health stamp on your Christmas mail means that you are a shareholder in the organized fight against tuberculosis.

NEW AND NON-OFFICIAL REMEDIES

The Council on Pharmacy and Chemistry has accepted the following articles:

GILLILAND LABORATORIES:

Schick Test.

Typhoid-Paratyphoid Bacterial Vaccine Immunizing.

LABORATORY PRODUCTS CO.:

Protein S.M.A. (Acidulated).

ELI LILLY & Co.:

Antistreptococcic Serum.

Normal Horse Serum.

Pertussis Vaccine.

Pneumococcus Vaccine Prophylactic.

Staphylococcus Aureus Vaccine.

Staphylococcus Vaccine.

Streptococcus Vaccine.

Vaccine Virus.

MALLINCKRODT CHEMICAL WORKS:

Bromeikon.

Bromeikon 5 Gm. Ampules.

MERRELL-SOULE CO.:

Vi-Mal-Dex (Orange).

H. K. MULFORD CO.:

Pertussis Bacterin-Mulford.

Typho Bacterin.

Typho-Serobacterin.

Typho-Serobacterin-Mulford Mixed.

NATIONAL ANILINE & CHEMICAL CO.:

Tetraiodophthalein Sodium-"National."

Tetraiodophthalein Sodium-"National" Vials 3½ Gm.

PARKE, DAVIS & Co.:

Corpora Lutea Desiccated-P. D. & Co.

Capsules Corpora Lutea Desiccated-P. D. & Co., 2 grains.

Capsules Corpora Lutea Desiccated-P. D. & Co., 5 grains.

Tablets Corpora Lutea Desiccated-P. D. & Co., 2 grains.

Tablets Corpora Lutea Desiccated-P. D. & Co., 5 grains.

SWAN-MYERS CO.:

Sterile Ampules of Mercury Oxycyanide, 0.008 Gm.

Sterile Ampules of Mercury Oxycyanide, 0.01 Gm.

Sterile Ampules of Mercury Oxycyanide, 0.016 Gm.

NON-PROPRIETARY ARTICLES:

Tetrabromphthalein Sodium (formerly called Tetrabromphenolphthalein Sodium).

Tetraiodophthalein Sodium.

LEDERLE ANTITOXIN LABORATORIES:

Concentrated Tetanus Antitoxin (Globulin)-Lederle

Scarlet Fever Streptococcus Antitoxin-Lederle (Refined and Concentrated)

RADIUM LIMITED, U. S. A.:

Saubermann Radium Emanation Activator, 100,000 Mache Units

E. R. SQUIBB & SONS:

Rabies Vaccine-Squibb Semple Method 14 Dose Treatment

Protein Extracts-Mulford.—Liquids obtained by extracting the protein of substances believed to be the cause of specific sensitization. For a discussion of the actions and uses, see Allergic Protein Preparations (New and Non-official Remedies, 1925, p. 278). Protein Extracts-Mulford are used both for diagnosis and treatment. They are marketed in 5 c.c. vials.

Insulin-Squibb 10 Units, 10 c.c.—Each c.c. contains 10 units of insulin-Squibb (New and Non-official Remedies, 1925, p. 174). E. R. Squibb & Sons, New York.

Insulin-Squibb 20 Units, 10 c.c.—Each c.c. contains 20 units of insulin-Squibb (New and Non-official Remedies, 1925, p. 174). E. R. Squibb & Sons, New York.

Insulin-Squibb 40 Units, 10 c.c.—Each c.c. contains 40 units of insulin-Squibb (New and Non-official Remedies, 1925, p. 174). E. R. Squibb & Sons, New York.

Insulin-Squibb 80 Units, 10 c.c.—Each c.c. contains 80 units of insulin-Squibb (New and Non-official Remedies, 1925, p. 174). E. R. Squibb & Sons, New York.

Neo-Silvol Ointment 5 Per Cent.—An ointment composed of neo-silvol (New and Non-official Remedies, 1925, p. 379), 5 per cent in a base composed of glycerin, benzoated lard, hydrous wool fat and petrolatum. Parke, Davis & Co., Detroit.

Mercurosal Solution.—Each c.c. contains mercurosal (New and Non-official Remedies, 1925, p. 234), 0.025 gm. (5/13 grain), in distilled water containing 0.1 per cent of sodium citrate. Parke, Davis & Co., Detroit. (Jour. A. M. A., Sept. 5, 1925, p. 745.)

Radon-Standard Chemical Co.—A brand of radon-N.N.R. For a discussion of radon, its actions and uses, see New and Non-official Remedies, 1925, p. 313. Radon-Standard Chemical Co. is supplied in the form of "implants" (minute glass tubes suitable for embedding in tumors), and in the form of larger tubes. Radium Chemical Co., Pittsburgh. (Jour. A. M. A., Sept. 12, 1925, p. 825.)

Iodipin 40 Per Cent.—An iodine addition product of sesame oil, containing from 39 to 41 per cent of iodine in organic combination. Iodipin 40 per cent is used as a contrast medium in myelography and pyelography for detecting urethral strictures and in the spinal column for the location of tumors. It is supplied in bulk and in ampules containing, respectively, 1 c.c. and 2 c.c. Merck & Co., New York.

Pertussis Bacterin-Mulford.—(New and Non-official Remedies, 1925, p. 354.) This is also marketed in packages of one 5 c.c. vial containing 2,000 million killed pertussis bacilli per c.c.; of one 20 c.c. vial containing 2,000 million killed pertussis bacilli per c.c.; and of four vials containing, respectively, 250, 500, 1,000 and 2,000 million killed pertussis bacilli per c.c. H. K. Mulford Co., Philadelphia.

Typho-Serobacterin.—(New and Non-official Remedies, 1925, p. 368.) This is also marketed in packages of three syringes containing, respectively, 1,000, 2,000 and 2,000 million killed sensitized typhoid bacilli; of three 1 c.c. vials, containing, respectively, 1,000, 2,000 and 2,000 million killed sensitized typhoid bacilli; and in thirty 1 c.c. vials, constituting ten tests of three doses. H. K. Mulford Co., Philadelphia.

Typho-Serobacterin-Mulford Mixed.—(New and Non-official Remedies, 1925, p. 369.) This is also marketed in

packages of three hypo-units containing consecutive doses of a mixture of killed sensitized typhoid bacilli, killed sensitized paratyphoid bacilli A and killed sensitized paratyphoid bacilli B; of thirty 1 c.c. vials, being ten tests of three doses of a mixture of the three bacilli. H. K. Mulford Co., Philadelphia. (Jour. A. M. A., Sept. 19, 1925, p. 901.)

Theocalcine.—A double salt or mixture of calcium theobromine and calcium salicylate. It contains not less than 44 per cent of theobromine. Theocalcine acts like theobromine, but is claimed to be less likely to produce gastric irritation than the official theobromine sodio-salicylate. It is supplied in bulk and in 7½ grain tablets. E. Bilhuber, New York.

Vi-Mal-Dex (Orange).—A mixture containing, approximately, maltose, 28 per cent; dextrose, 10 per cent; dextrin, 48 per cent; orange juice sugars, 9 per cent; citric acid, 1 per cent; ash, 1 per cent; moisture, 3 per cent. One hundred gm. contains the equivalent of 93.5 c.c. of fresh orange juice. Vi-mal-dex (orange) is proposed as a carbohydrate food for use in the feeding of infants. In addition to the carbohydrates, dextrose, maltose and dextrin, it presents the antiscorbutic properties of orange juice. For use, vi-mal-dex (orange) is mixed with water or milk. Merrell-Soule Co., Syracuse, New York.

Sterile Ampules of Mercury Oxycyanide, 0.008 Gm.—Each ampule contains 5 c.c. of solution, representing 0.008 gm. (1¼ grain) of mercuric oxycyanide-N.N.R. (New and Non-official Remedies, 1925, p. 228). Swan-Myers Co., Indianapolis.

Sterile Ampules of Mercury Oxycyanide, 0.01 Gm.—Each ampule contains 5 c.c. of solution, representing 0.01 gm. (1/6 grain) of mercuric oxycyanide-N.N.R. (New and Non-official Remedies, 1925, p. 228). Swan-Myers Co., Indianapolis.

Sterile Ampules of Mercury Oxycyanide, 0.016 Gm.—Each ampule contains 3 c.c. of solution, representing 0.016 gm. (¼ grain) of mercuric oxycyanide-N.N.R. (New and Non-official Remedies, 1925, p. 228). Swan-Myers Co., Indianapolis.

Tetraiodophthalein Sodium.—Tetraiodophenolphthalein sodium. The sodium salt of a dibasic dye, tetraiodophenolphthalein. Tetraiodophthalein sodium contains not less than 53 per cent of iodine. It is used for the roentgenologic examination of the gallbladder. Following the intravenous injection or, if decomposition is avoided, the oral administration, the substance appears in the normal gallbladder in sufficient concentration to cast a shadow to the roentgen ray. The use of tetraiodophthalein sodium is in the experimental stage and workers are cautioned as to the selection of types of cases in which it is indicated and its possible toxicity in large doses.

Iodeikon.—A brand of tetraiodophthalein sodium-N.N.R. It is supplied in bulk and in 3.5 gm. ampules. Mallinckrodt Chemical Works, St. Louis.

Tetraiodophthalein Sodium—"National."—A brand of tetraiodophthalein sodium-N.N.R. It is supplied in bulk and in 3.5 gm. vials. National Aniline and Chemical Co., New York. (Jour. A. M. A., Sept. 26, 1925, p. 975.)

Protein S.M.A. (Acidulated).—A modified milk preparation having a relatively high protein content and a relatively low carbohydrate content. Each 100 gm. contains approximately: protein (of milk), 35 gm.; S.M.A. fat (consisting approximately of tallow oil, 0 to 10 per cent; coconut oil, 15 per cent; cacao butter, 20 per cent; cod liver oil, 7.5 to 12.5 per cent; tallow, 45 to 50 per cent), 22 gm.; carbohydrate (lactose), 28 gm.; ash, 6 gm.; moisture, 2 gm.; desiccated lemon juice, equivalent to 16.7 c.c. of fresh juice. The content of lactic acid is regulated so that when the substance is diluted according to directions the liquid will have a PH of 4.6. The use of protein S.M.A. (acidulated) is proposed as a means of checking diarrhea, in malnutrition and marasmus, and in the feeding of prematurely born infants needing a high caloric intake. Laboratory Products Co., Cleveland.

Bromeikon.—A brand of tetrabromophthalein sodium-N.N.R. (formerly called tetrobromphenolphthalein sodium) (New and Non-official Remedies, 1925, p. 141). Bromeikon is supplied in bulk and in ampules of 5 gm. Mallinckrodt Chemical Works, St. Louis.

Iron in Therapeutics.—It seems possible that much of the therapeutic uncertainty of iron administration may be cleared up by recent studies involving large numbers of nearly identical animals over long periods of time under uniform conditions, with respect to the effect of iron administration. It was found that iron was stored in the liver or spleen, but was not converted into hemoglobin. The experiments seem to show the futility of prescribing iron in anemia. On the other hand, the efficiency of food iron seemed pronounced. (Jour. A. M. A., October 10, 1925, p. 1140.)

Neurosine.—The Council on Pharmacy and Chemistry in 1915 reported that Neurosine (Dios Chemical Co.) is a shotgun nostrum which violates practically every principle of modern therapeutics. The manufacturers claim that each fluidounce contains: "40 grains C. P. Potassium Bromide, 40 grains C. P. Ammonium Bromide, 40 grains C. P. Sodium Bromide, 1 grain C. P. Zinc Bromide, 32 grains Extract Lupuli, .60 grain Extract Cannabis Indica, .075 grain Extract Belladonna, .075 grain Extract Henbane, .40 minims Extract Cascara Sagrada, .060 grain Oil Bitter Almonds, 5 per cent Alcohol and Aromatic Bitters." Neurosine, therefore, contains 121 grains of bromid in each fluidounce. The formula of Neurosine is, however, not featured by the promoter. The danger of administering such a preparation as Neurosine without knowing its bromid content is apparent. (Jour. A. M. A., October 10, 1925, p. 1155.)

Possible Danger of Poisoning From Mercurochrome.—Sufficient evidence has been published to show that mercurochrome causes little or no gastro-intestinal disturbance until it has been taken in large doses for a week or more. In New and Non-official Remedies it is stated that no systemic effects have been observed following the local application of mercurochrome. This, together with the fact that the preparation is offered for lay use only in small packages of the solution, would seem to make the use of mercurochrome by the laity no more dangerous than that of tincture of iodine. (Jour. A. M. A., October 17, 1925, p. 1242.)

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

ACRIFLAVINE: ITS INTRAVENOUS INJECTION IN THREE CASES OF EPIDEMIC ENCEPHALITIS

C. EUGENE RIGGS, M.D.

St. Paul

In June, 1924, Drs. Strecker and Willey reported to the American Psychiatric Association four cases of epidemic encephalitis treated by the intravenous injection of acriflavine, believing with Dr. Solomon "that we should not sit back in a hopeless attitude but rather we should continue our attempts along this line." Dr. Hengstler and I have been giving acriflavine a fair and careful trial. Prognosis depends upon the (basic) pathology. No treatment can restore degenerated nerve cells. Therefore, in the earliest stages of the disease—the acute phase—before nerve cell destruction occurs, is the favorable time for experimental therapy. While we are using it in the chronic forms of encephalitis, it is the acute attack with which this clinical note is concerned.

More than twenty different therapeutic agents have been used in this disease with bitterly disappointing results—a specific is not yet in the offing. Acriflavine and mercurochrome in the acute stage appeal to the medical mind. The former, experience has shown, possesses real possibilities; the latter in infections of the central nervous system I believe to be utterly worthless. The importance of administering acriflavine early is emphasized by a case now under observation. Nine months ago she developed encephalitis. The symptoms were so mild that they were mistaken for a mild functional nervous state; within the past ten days there has occurred an acute flaring up of the disease. After six intravenous injections of acriflavine there has been no amelioration of the symptoms. Some years ago I advised sodium iodide intravenously in chronic encephalitis; extended observation has shown it to be a therapy of great value. Malarial inoculation as in paresis is believed to have demonstrated its worth. Acriflavine is now on trial.

The following three cases have been an interesting study and the apparently direct results following the injections have surprised us greatly; the improvement observed has equalled in every way that recorded by the writers above quoted, in their one acute case.

Case 1.—Miss C., Dr. Hengstler's patient. Age 24; referred by Dr. Nels Werner of Eau Claire, and Dr. Post of Barron, Wisconsin. She entered the hospital July 27, 1925, complaining of "a nervous breakdown." Family history

shows that father died of heart trouble; mother living and well; two brothers and three sisters living and well; one brother dead in infancy.

Patient, a domestic, always well prior to her present sickness; tonsils and adenoids had been removed. In February, 1925, she had an attack of la grippe, which laid her up for a few days. In April, 1925, her present trouble appeared. She was laid up for a week, complaining chiefly of being very tired, listless and somewhat restless. No appetite; dreamed a great deal at night. She improved and worked until a month ago, when her former symptoms returned. She complained of headache, a drawing sensation in the back of her neck, shooting pains in the left arm and a very tired feeling. She grew steadily worse and when seen by us she was very weak and tired; was unable to be up at all; there was severe headache and persistent vertigo. This vertigo was so severe that she was unable to stand on her feet unsupported without falling to the floor. Her nights were sleepless. She states that lately she has had to take a long time to think and is unable to correlate her thoughts; memory is poor. She says she has grown progressively worse; dreams at night disturb her; she is very listless and has no strength to do anything. There is no diplopia and no depression.

Neurological examination shows a strongly positive Romberg with a tendency to fall backwards. Her pupils and cranial nerves are normal; superficial reflexes normal; knee-jerks and Achilles jerks normal; there is no Babinski and no ankle-clonus; co-ordination and deep muscle sense are normal and sensation is normal to pain, touch and temperature. There is reduced muscle power in both arms and both legs. Examination of the eyegrounds was normal. Hemoglobin 62 per cent; blood pressure 114 systolic, 70 diastolic; urine negative; Wassermann negative; colloidal gold negative; sugar .111. There was no psychosis; she grew very restless during the examination, tired easily and became very dizzy when made to change position, and was very easily excited and agitated.

Case 2.—Miss K. Age 40; referred by Dr. James Gilfillan, St. Paul. First examined August 3, 1925; complained of fainting spells; family history shows the father died at 63 of arteriosclerosis; mother at 64 of gallbladder disease. Three brothers living and well.

Typhoid when six years of age; has always been a nervous individual; never strong; was unable to attend school for a time when a girl because of ill-health. She has always had so-called "hysterical attacks"; from childhood has suffered from migraine, which has greatly improved during the last two years.

Present illness began about three weeks ago, following an attack of la grippe which occurred in June and laid her up for a few days. There are sudden attacks of weakness, during which she falls down on the floor and all strength goes from her limbs so that she cannot get up unaided for several moments. She complains of cold feet, of a twitching in the muscles of the left forearm, of fre-

quent momentary losses of consciousness. After such a spell her muscles and flesh feel very sore and she falls asleep. She states that for the past fourteen years she has had attacks of this kind but only for the past month has she had the minor attacks where she loses herself for a moment without falling. They have been occurring very irregularly every day or several days apart. On some days she has five or six. Since the last seizure, three weeks before we saw her, in walking she goes to the left.

Neurological examination, August 3, was negative in every respect. Hemoglobin 88 per cent; blood pressure 124 systolic, 60 diastolic; urine negative. Following the examination she returned to her home and during the next few days became very drowsy, sleeping most of the time, and was very indifferent to things going on about her. She was also so dizzy that she could not stand up unaided. Two visits at the home showed a rise of temperature in the afternoon to 99.5°. On August 13 she was sent to the hospital; a lumbar puncture was performed which showed the spinal fluid to be under normal pressure, clear in color, no cells, globulin negative; Wassermann negative; sugar 104.

The neurological examination repeated on this date showed a moderate bilateral Kernig, more pronounced on left. There was also some fibrillary twitching of muscles in the left arm and a very slight rigidity of the neck. Aside from this all reflexes were present and normal and sensation was normal. There was no diplopia at this time but close questioning brought out the fact that there had been fleeting periods of diplopia a few days before while she was at home. The outstanding features when admitted to the hospital were marked lethargy, severe vertigo, which showed itself on the least change of position of her head, some headache, the head falling backward or forward, and a generally very indifferent attitude, and exhaustion on slight exertion. In this patient encephalitis lethargica grafted itself on an essential epilepsy.

Case 3.—Age 33 years; seen in consultation with Dr. Chas. Hensel, to whose courtesy I am indebted for a report of this case. At midnight, July 6, 1925, the patient was awakened by a severe occipital headache; the next morning he said he felt weak and exhausted. He went to work as usual, but after reaching the office he had a bad vomiting spell. Unable to work, he returned home and rested forty-eight hours. Although suffering from backache which extended the whole length of the spine and which did not permit his sitting, but compelled him to stand or lie flat, he tried to work, but was forced to go home, where he remained in bed two and a half days. Essaying to go into another room, he fell unconscious to the floor; after twenty minutes, consciousness returned and with it a persistent vomiting, which continued for two days. He was sleepless and complained of acute pain in the back of the head and in the neck. He ran a temperature ranging from 99 to 101° for about a week. The pupils were very small, but equal and reacted sluggishly to light. There was rigidity both of the neck and spine; knee-jerks were exaggerated, left more than right; there was a double Kernig; no

Babinski; no ankle-clonus; sensation was normal. Lumbar puncture showed increased pressure. The spinal fluid contained a large amount of blood; Wassermann negative, as was also the culture. This case possessed unusual interest because two years ago this patient experienced an apparently similar attack, the blood in the spinal fluid being a marked feature of both illnesses.

Farquhar Buzzard has emphasized the hemorrhagic type of epidemic encephalitis, of which this undoubtedly is a typical example. There had been an approximate recovery; he showed personality changes and was not as strong as he was before the first attack. He tired easily and complained of weak spells. During both illnesses spinal drainage offered great relief, but under acriflavine intravenously, improvement was noticeable after the first few injections; recovery was rapid and uneventful. Dr. Hensel informs me that he now feels very much better than he did after his apparent recovery from the first attack.

Each of these three patients received eight consecutive intravenous injections of neutral acriflavine—a purified form. This drug, especially prepared for intravenous use, comes in ampules. It is dissolved in freshly made normal saline heated to the boiling point, enough acriflavine being added to make a 0.5 per cent solution. Mix thoroughly, and while at a boiling temperature filter through the best quality filter paper. Sterilize by direct boiling for five minutes and cool to body temperature in a dark place, because light induces chemical decomposition. Utmost care should be taken during the injection (which should be given immediately after the preparation of the solution) to prevent any escape of the fluid into the perivascular tissues, such a mischance causing redness and great pain over a region exceeding greatly the affected area. The dosage is 10 c.c. of a 0.5 per cent solution. As much as 30 c.c. can be administered with safety (Strecker & Willey). The patient should be told of its staining the urine, mucus and other secretion, otherwise this yellowish coloration may cause needless anxiety. In order to avoid distressing symptoms the injection should be given slowly at the rate of 10 c.c. in five minutes, in some patients even slower. If administered more rapidly there will occur a gasping respiration with air hunger, associated with a sensation of heat, affecting the mucous membrane of the respiratory tract, added to which is an intense lachrymation. After the first two or three injections our patients have experienced great relief and by the time the eight were given the improvement was truly remarkable. The Kernig, Babinski and other objective signs disappear slowly. In Case 2, fever was one of the most persistent symptoms. There is no rule in epidemic encephalitis for convalescence; it may be distressingly slow or dramatically rapid, as in a case seen recently with Dr. Cremer of Hastings, where after spinal drainage recovery was a matter of a comparatively few days.

I am making no claim for acriflavine. I am in no sense an enthusiast, but the apparent benefit derived from this drug in these cases seems more than an accident, and, as Dr. Strecker states, it is a logical method of approach and I believe a justifiable form of experimental therapy.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

FINAL RESULTS OF THE OPERATIVE TREATMENT OF GASTRIC ULCER: Meyer, Karl A., Brams, W. A., and Graves, W. N. (Ann. Surg., 1925, Vol. LXXXI p. 1002). A series of 22 cases of gastric ulcer is reported, in which a Polya type of stomach resection had been performed. All of these cases had been treated medically without permanent relief; and clinical evidence pointed to chronic ulcer of considerable severity. A postoperative study of 18 cases at varying periods showed absence of free hydrochloric acid in all; the emptying time of the stomach, as shown by the x-ray, was rapid in 10 to 15 cases re-examined; the bowels were normal in 10 out of 12 instances; and diarrhea was present in only one case. The patients were greatly improved after operation, as shown by freedom from symptoms, gain in weight, and return to former occupation.

The authors consider pyloric resection the method of choice in treating chronic gastric ulcer because it removes the ulcer-bearing portion of the stomach, and eradicates those factors such as gastric juice and retention of stomach contents, which are considered to play an important part in the formation and recurrence of peptic ulcer.

J. K. HOLLOWAY, M.D.

APPENDECTOMY: C. A. Roeder, M.D. (Arch. Surg., 1925, Vol. II, pp. 18-24). In 105 explorations of the cecum the author found postappendectomy adhesions present in 98, and of these only 8 were of negative significance. In 8 of the 90 the cecum was adherent to the parietal peritoneum in the line of previous incision. In 60 the great omentum was adherent to the head of the cecum. In 11 loops of terminal ileum were adherent to the meso-appendix stump and to the head of the cecum. In this group there occurred three bowel obstructions, two due to bands from the old meso-appendix, and one due to a band from the site of the previous appendix stump. In 11 cases adhesions were confusing, involving loops of ileum, the great omentum, and cecum. Thirty-two of 90 patients complained of constipation starting for the first time after appendectomy. In these the cecum was found adherent

in such a manner that its function as a contracting diverticulum was interfered with.

Roeder considers the purse-string suture and the stump of the appendix largely responsible for the formation of adhesions. As the cecum is very thin walled any type of Lambert suture frequently penetrates the cecal mucosa, thus spreading infection. The stump of the appendix is seldom rendered sterile even with a cautery, unless the mucosa in the deepest portion is attacked. The cautery seldom reaches this area. Phcnol is the best chemical substance to use. Crushing forceps applied near the base frequently force bacteria through the coats of the appendix; and the crushed groove leaves an infected pocket in the cecum if the stump is inverted.

These contentions are supported by cultural evidence. Eighty per cent of the purse-string sutures and 24 per cent of the crushing forceps gave positive cultures. However, not one of the 100 patients indicated any signs of post-operative infection.

The author believes improvement in results would follow covering the mesenteric stump, dispensing with crushing forceps, sterilization of the stump with phenol, and replacing the appendiceal stump if not inverted into the peritoneal cavity so that adhesions form only on the posterolateral peritoneum.

The inverting suture is ideal if penetration of the cecal mucosa can be avoided. When difficult to apply, this suture may be abandoned, provided the stump of the appendix is carefully sterilized.

J. K. HOLLOWAY, M.D.

CHRONIC PANCREATITIS AS A CLINICAL ENTITY:

J. William Hinton (S. G. and O., 1925, xli, 422). Frequently following cholecystectomy for cholecystitis or cholelithiasis the patient may have or continue to have acute exacerbations of pain similar to those he had previous to operation. The explanation of these attacks often leads one to suspect an overlooked calculus in the common bile duct, but the author feels that in many instances the symptoms are due to an acute exacerbation of a chronic pancreatitis.

The etiology of acute pancreatitis seems to be in the majority of instances a lymphangitis. The mark of Franke has definitely shown that the lymphatic drainage from the gallbladder and biliary tract is to the head of the pancreas. Braithwaite has shown a direct lymphatic drainage from the ileocecal region to the subpyloric glands. Pancreatic infections usually begin in and are confined to the head of the pancreas. In the majority of instances the author feels that the gallbladder or biliary tract is the source of infection in chronic pancreatitis.

The acute attacks of pancreatitis following cholecystectomy are often similar to the attacks of pain the patient had before operation. The pain is sudden in onset, constant, and may be in either the right upper quadrant or left kidney area. The attack may last from a few hours to 48 or 72 hours. Vomiting is usually an outstanding symptom. The vomitus is clear or slightly bile stained. Because of the sudden pain and vomiting, high intestinal obstruction may be suspected, but the patient does not

appear so ill as do those with intestinal obstruction. The extremely severe cases may show slight jaundice. On physical examination the abdomen is usually not distended nor is it markedly rigid. There is usually an indefinite tenderness in both upper quadrants. The temperature is often normal, but may reach 100. The milder cases have a normal or slightly increased leukocyte count; urine is negative.

The author emphasizes the fact that one should not be too anxious to explore these cases, as many of the patients gradually recover after the primary focus has been removed. The cases that are reoperated continue to have recurrent attacks and common duct drainage does not seem to be effective.

CONCLUSIONS

1. Some of the recurrent attacks of upper abdominal pain following cholecystectomy seem to be due to acute exacerbations of a chronic pancreatitis.
2. The diagnosis should be arrived at by a very careful process of elimination.
3. Some of these cases spontaneously cure themselves if given the opportunity.
4. Surgery employed in these cases does not seem to cure the condition or prevent subsequent attacks.

C. S. WILLIAMSON, M.D.

PEDIATRICS

SUPERVISORS:

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GASTRIC DIGESTION IN NEW-BORN INFANTS:

C. Griswold, M.D., and A. T. Shohl, M.D. (Amer. Jour. of Diseases of Children, October, 1925). The pH values for the gastric contents of unfed infants agree with those in the literature which were obtained by titration. They demonstrate the presence of free hydrochloric acid. The pH 2.6 was less acid than that of Tangl (pH 1.3 to 1.8) for pure gastric juice. But no other excretion or secretion of the body could yield so acid a reaction; the material was unquestionably gastric juice.

The author's buffer values approximated those of other workers who used pure gastric juice. Just what constitutes the stimulus to this secretion of hydrochloric acid is not known. Pollitzer holds to the view that the ingestion of amniotic fluid during labor is responsible because he found albumin in the gastric contents. The presence of food is not necessary to stimulate the secretion of gastric juice. It may be reflex, from sucking, "psychic" or due to hunger, and may normally precede the ingestion of food in an infant.

The pH values of the gastric contents withdrawn one hour after a test meal in the new-born infants are more acid than those of a group of infants ranging from 30 to

19 months of age. The pH averaged 2.5 and 2.6 for the new-born infants; for the older infants, 76 per cent of the values lay between pH 3.9 and 4.6. At the end of one hour, after the ingestion of a partly skimmed milk mixture, digestion in new-born infants has been completed. This is shown by the high hydrogen ion concentration, the low buffer value and the small volume of gastric contents recovered. The infants undoubtedly have an increased capacity for hydrochloric acid secretion and gastric digestion. Practically, it would seem logical to feed new-born infants a more concentrated and a more alkaline food.

R. N. ANDREWS, M.D.

ALLERGIC MANIFESTATIONS IN INFANCY AND CHILDHOOD: George Pinckss, M.D., and Hyman Miller, M.D. (*Arch. Ped.*, September, 1925). The clinical manifestations resulting from the introduction of such proteins are dependent in character, not on their site of entry into the body but on the particular tissue or tissues which may be sensitized. Thus, in one individual, it may be the lining mucous membrane of the respiratory tract resulting in hay-fever and asthma, and in another it may be the skin, resulting in urticaria or eczema.

Perhaps most often overlooked in infancy and childhood are the allergic disturbances of the nose and throat. The individual suffering from this allergic manifestation complains of almost constant "cold in the head," characterized by spells of sneezing, coryza and obstructed nasal breathing. Examination shows great hypertrophy of the tonsils and adenoids, the nasopharynx studded with masses of lymphoid tissue. Removal of tonsils, adenoids and turbinates does not relieve the symptoms. In fact, such removal often means but a regrowth of tissue consequent upon the lymphoid hypertrophy characteristic of protein sensitization.

If the respiratory mucous membrane is sensitized beyond the nasopharynx, that is in the bronchi and bronchioles, these patients add to their history frequent attacks of bronchitis with or without fever and with or without asthma. Sensitization of the gastrointestinal tract is often present, being characterized by the more or less vague abdominal distress and loss of appetite.

Occasionally in so-called "egg poisoning," an individual on partaking of even the minutest quantity of egg, immediately experiences a burning sensation of the lips, mouth and esophagus, followed by swelling of their mucous membranes and great difficulty in breathing.

The author finds the allergic child vaguely nervous, irritable, difficult to control, having little appetite and suffering from enuresis.

Perhaps the most common and generally recognized example of protein sensitization in infancy and childhood is eczema. On testing these infants, skin reactions to a varying number of food proteins are frequently obtained. The removal of these proteins from the diet of the mother often results in the clearing up of the eczema in the child.

In the bottle-fed infant with eczema, the feeding problem may be complicated by a sensitization in cow's milk. The necessity for removal of this food from the diet may be met by substituting goat's milk or, if sensitization to both goat's and cow's milk is present, the advisability of permitting

the eczema to remain and caring for the general welfare of the infant must be considered.

In addition to the food proteins as a cause of eczema, one must also take into account the production of eczema by contact with substances such as with wool, silk or pollens, such cases being not at all uncommon.

Another skin manifestation of allergy is urticaria.

The prognosis as to recovery in any allergic manifestation in which an attempt is made to determine the offending protein is very good.

R. N. ANDREWS, M.D.

THE COMPARATIVE NUTRITIONAL VALUE OF WHITE AND WHOLE WHEAT FLOUR: C. Ulysses Moore, M.D., and Jessie Laird Brodie, B.A. (*Arch. Ped.*, September, 1925). No other class of foods undergoes so great a change in the process of preparation as do the cereal grains. Our modern processes of milling wheat, our most commonly used cereal, eliminate the germ and most of the superficial layers of the kernel. Almost 30 per cent of the original grain is omitted from "patent flour," and the deplorable fact is that this discarded 30 per cent contains practically all the vitamin element and about 75 per cent of the mineral constituent of the cereal.

White mice on a properly balanced diet containing whole wheat flour increased in weight four times as rapidly as did their brothers on a chemically identical diet in which the whole wheat was replaced by white flour.

Whole wheat improves the appetite so that the mice receiving it consumed twice the food eaten by those on white flour.

The gain in weight per unit of food consumed was doubled by using the whole wheat.

From the standpoint of health and life, whole wheat is incomparably superior. The mice on it were healthy, happy and contented. Many of those on white flour developed paralysis and three died.

Those on whole wheat had much greater resistance to cold weather.

The fur of the white flour group became clumped and abnormally oily.

When the white flour mice were given the whole wheat diet, they rapidly regained weight, their fur became normal, and they seemed contented, thus furnishing positive, as well as negative, proof of the superiority of whole wheat.

The dietary difference between white and whole wheat flours is largely a difference in vitamin B. Modern milling removes this necessary food factor.

This experiment demonstrated that the cost of food per gram of weight gained was 4.9 cents on a diet containing white flour and 3.7 cents on one containing whole wheat. For nutritional purposes, whole wheat flour is worth nearly twice as much as white flour.

The presentation of facts such as these to parents and teachers wins their support to scientific feeding and will lead, the author trusts, to healthier and happier future generations.

R. N. ANDREWS, M.D.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:

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DIABETES, PREGNANCY, AND INSULIN: Henneberg and Bickel (*Gynecologie et Obstetrique*, July, 1925). This report comes from Beuttner's clinic in Geneva and concerns the successful treatment with Insulin of a case of true diabetes during gestation. The authors refer to the confusion of statements concerning the frequency of this association and of the prognosis. They believe that pregnancy rarely occurs in a diabetic woman and that there is a tendency to sterility, certainly in established cases of diabetics. Because of the increase of fat, the disturbed metabolism, pregnancy is not likely to occur, and the organism does not become adapted to the nutrition of the fetus. Sexual apathy is common in diabetes, and atrophic changes in the uterus and ovaries develop early in the disease.

On the other hand, pregnancy is frequently complicated by transitory disturbances in the carbohydrate metabolism. The authors recognize four types of the condition: 1. Pseudo-glycosuria, which is really a lactosuria, is not influenced by dietary restriction, is transitory, and is not an indication of predisposition to diabetes. 2. Alimentary glycosuria refers to a slight disturbance in the carbohydrate metabolism, which is usually benign in its effect. This usually appears in the latter months of pregnancy and may amount to several grams of glucose to the liter, but is not accompanied by any of the other evidences of diabetes, and disappears on regulating the diet. It is recognized as a transitory overloading of the liver. It is now accepted that many of the so-called alimentary glycosurias are really instances of (3) "Renal Glycosuria," which is also a benign condition. The clinical evidences of true glycosuria are absent. The glycosuria is likely to persist in spite of dietary treatment, but disappears after labor. The fourth group concerns the cases of true diabetes characterized by definite hyperglycemia, which is influenced by diet, and accompanied by the usual symptoms of diabetes. It is important that any case of glycosuria be studied and placed in the proper group. The prognosis is favorable for the first three types of condition, provided certain dietary principles are followed. The fourth type, however, presents serious possibilities both for mother and baby. It is not impossible that what is apparently a simple glycosuria will reappear in subsequent pregnancies as a true diabetes. Many of the statements concerning the prognosis of diabetes and pregnancy come from the various standards of diagnosis and failure to eliminate the simple glycosurias.

The author states that of the cases of true diabetes in the pregnant woman about one-half die in the course of pregnancy, labor or within a few months. The immediate

fetal mortality is about 55 per cent, and many more die within the first few days after birth.

Interruption of pregnancy is not advised, since post-operative exacerbation of glycosuria and acidosis with coma are common. They consider the only course is active medical and dietary treatment of diabetes, together with proper dosage of insulin. A case is reported which presented all of the signs of diabetes developing during pregnancy and was admitted to the hospital in coma. Intensive medical treatment with customary doses of insulin resulted in amelioration of the symptoms, successful delivery of a healthy baby, and final clearing up of glycosuria and acidosis. They believe that the prompt and active use of insulin will enable the obstetrician to carry such patients safely through the latter months of pregnancy and save a large per cent of the newborn.

ARCHIBALD L. McDONALD, M.D.

ROENTGENOLOGY

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ROENTGEN RAY STUDY OF 926 CASES OF RICKETS: Groover, Christie & Merritt (*Radiology*, Vol. 5, p. 189, Sept., 1925). The technic is difficult and the exposure must be extremely rapid. Good detail in the roentgenogram is imperative.

A clinical diagnosis of rickets was made in 68.7 per cent of these cases, an X-ray diagnosis in 66.5 per cent. In the incipient cases, it appears that the x-ray diagnosis is far more accurate than the clinical.

The findings are most characteristic in the distal end of the ulna, but in the florid cases can be found widely distributed. A "beaker" shape at the epiphyseal line of the ulna with a loss of bone density in the distal end of the femur are the earliest signs. Later there is irregularity, loss of distinction in the zone of proliferation, periosteal thickening, irregularity of the epiphysis, flattening of the upper end of the tibia, curvatures, cortical density along the curvatures. The cupping of the metaphysis and its irregularity are most characteristic.

Fractures are frequent, and when healing occurs there is markedly excessive callus, in no orderly arrangement. Cystic areas may be present in the shaft.

Healing is indicated by either a dense white line of calcium in the zone of proliferation or increased density at the ends of the shaft, combined with the obliteration of the irregular cupping.

Differential diagnosis of the florid type is not difficult. Lues is not so uniformly distributed and shows bone distinction and production. The metacarpals, if involved, usually indicate a luetic origin. When both lues and rickets are present in the same bone it is almost impossible to distinguish them.

LEO G. RIGLER, M.D.

THE ROENTGEN ASPECT OF EMPYEMA IN CHILDREN: Carty & Liebman (*Am. Jour. Roent.*, Vol. 14, p. 215, Sept., 1925). The thorax of a child is so small that a considerable collection of fluid is impossible. As a result the rib shadows and the costo-phrenic sinus are not always obliterated even with an apparently extensive effusion. The visibility of the costo-phrenic sinus in 28 per cent of the cases was notable.

Displacement of the mediastinum occurs readily and asymmetry of the chest or scoliosis of the spine may be seen early. Careful placing of the child in position is important, as displacements of the heart or deformities of the chest may be simulated, if the chest is not held straight.

Change in position produces a change in shape and density of the shadow in certain cases, particularly where the amount of fluid is small. Plates were therefore taken in both prone and sitting positions.

Pneumonia can be differentiated by the rapid changes in its appearance, the absence of a fluid line, the less homogeneous shadow, and the limitation to a lobe. Thickened pleura does not change with change in position and the mediastinum is likely to be displaced toward the lesion rather than away from it. The latter helps differentiate massive collapse also.

Pericardial effusion may be simulated by mediastinal empyema.

The position of the tube after a drainage operation should be carefully watched.

LEO G. RIGLER, M.D.

DEEP ROENTGEN THERAPY OF MAMMARY CARCINOMA: Evans and Leucutia (*Am. Jour. Roent.*, V. 14, p. 135, Aug., 1925). Mammary carcinomata may be classified into five groups: 1. A small single, freely movable focus. 2. A large carcinoma with involvement of axillary glands. 3. Involvement also of supra- and infra-clavicular glands. 4. Thoracic involvement. 5. Abdominal or general carcinomatosis.

The first two should be treated by surgery with post-operative radiation within 10 to 12 days. This should cover a very wide area, attempting to radiate all parts to which dissemination might occur by continuity through the lymph plexus. It is upon the manner of dissemination that the final outcome will depend. The whole anterior and posterior chest, including the cervical region, the arm, and the upper abdomen on the side of the lesion are thus radiated. The area extends to the other side, well beyond the mid-sternal line.

The dosage is comparatively moderate, using 90 per cent S.U.D. as a standard with shortwave rays, heavy filtration, long focus skin distance, and large portals of entry.

The results of surgery with post-operative radiation are apparently far better than of surgery alone, insofar as their experience indicates.

In the remaining three groups radiation therapy should always be used, as they are inoperable. Palliation is usually obtained and in a few cases apparent cures have resulted.

LEO G. RIGLER, M.D.

EYE, EAR, NOSE AND THROAT

SUPERVISORS:

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PHLYCTENULAR CONJUNCTIVITIS AND KERATITIS: CAUSES AND PREVENTION: N. Bishop Harman, M.A., M.B. (*British Medical Journal*, August 29, 1925, p. 379). Next to ophthalmia neonatorum, phlyctenular kerato-conjunctivitis is the most frequent cause of educational blindness from superficial ocular inflammation among school children. A number of etiologic factors are of importance:

(1) The social factor—poverty and bad food—is a predisposing cause.

(2) The age incidence—rare under one year, thence gradually increasing up to the age of 5, after which there is a steady decline. At this maximal age, what with nasal catarrh, herpetic lips and facial impetigo, there is more than sufficient irritation to the fifth nerve to produce a localized reaction.

(3) The seat of election in 66 per cent of the cases was at or near the lower and outer sector of the limbus, an area innervated by a loop formed by a small branch from the lachrymal nerve, and from the second division of the fifth. Here again it would seem that a fifth nerve irritation might stand in direct causal relationship. The branch from the lachrymal may also explain the profuse lacrymation in this disease.

(4) The possibility that this may be a local, ocular infection is dispelled by the absence of bacteria in fresh, unbroken phlyctenules.

(5) This malady has no seasonal incidence, and so is unlike most other forms of conjunctivitis.

(6) The histologic structure is that of a minute blister. All these points bear out the idea that the disease is not primarily a local, but a constitutional one.

While it is possible that tuberculous children are more frequently subject to phlyctenular lesions than the non-tuberculous, it is probably the lowered vitality and enfeeblement incident to lack of proper food, of sunshine and fresh air which is primarily to blame, and not the presence of tuberculosis.

The prevention of this disease involves general social improvement. In particular, careful watch must be made for children of generally debilitated condition, and for those with infected mouths or throats. Open air schools and appropriate dental and throat treatment are essentials if phlyctenular lesions are to be eradicated.

VIRGIL J. SCHWARTZ.

BOOK REVIEWS

BASAL METABOLISM. Eugene F. Du Bois. 1924. Lea & Febiger.

This monograph is a comprehensive discussion and survey of the present knowledge of basal metabolism. It is quite evidently the result of years of study and experimentation and observation on the part of the author and his assistants, together with a thorough review of literature on this subject.

There is a brief history of the study of metabolism, and metabolism of fat, carbohydrate and protein is discussed. A review of the laws of physics which bear on the study of basal metabolism together with discussions of gases of the body and of the general principles of apparatus used and methods of calculation, are given consideration. Discussion of relation of basal metabolism and surface area follows consideration of normal basal metabolism levels and methods of surface area determinations

as well as conditions which cause variations in basal metabolism in the normal individual.

The value of basal metabolism determinations in disease is gone into extensively in undernutrition, overnutrition, diabetes and disturbances of thyroid, adrenal, pituitary and sex glands. The value of basal metabolism determinations in diabetes as aiding in prognosis and in thyroid disease as aiding in diagnosis and prognosis, is shown.

Effect of fever on basal metabolism is discussed with especial consideration being paid to tuberculosis, pneumonia, syphilis and cholera and also the importance of water metabolism and maintenance of nutrition is stressed in febrile diseases. There is a short study of basal metabolism in nervous and mental disorders and of the effect of drugs on metabolism with numerous references to recent literature.

This text is valuable for reference especially to the student of diagnosis. It is written in a concise manner and contains a great deal of valuable information dealing with the metabolism and nutrition. L. R. CRITCHFIELD, M.D.

WANTED—Experienced secretary desires medical secretarial work—Minneapolis or St. Paul preferred. Experience obtained in well known Clinic. Splendid references. Address C-61, care MINNESOTA MEDICINE.

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POSITION WANTED—Graduate registered nurse wishes position as laboratory technician. Competent in all lines of modern laboratory work; also basal metabolism. Augusta Byquist, R.N., 3145 Elliot Avenue South, Minneapolis.

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